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# USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

No. 100

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# USSR REPORT

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## CONSTRUCTION PLANNING AND ECONOMICS

### USSR, GDR COOPERATION IN CONSTRUCTION MATERIALS

Moscow BETON I ZHELEZOBETON in Russian No 10, Oct 83 pp 2-3

[Article by I. I. Ishchenko, deputy chairman, USSR Gosstroy: "Efficient Collaboration"]

[Text] One of the most important trends in the international socialist division of labor is the scientific and technical collaboration of socialist countries. The 32d (1978) and 33d (1979) sessions of the Council for Mutual Economic Assistance approved five long-term special-purpose programs for such collaboration in different fields of the national economy. The programs approved contain about 340 measures, including 117 problems in science and technology. Most of the measures will be implemented according to plan on the basis of multilateral and bilateral agreements.

Within the framework of the Program of Integration and Cooperation in Scientific and Technical Fields between the USSR and the GDR, a number of inter-governmental agreements have been concluded on the joint conduct of scientific research and planning and design operations and on the organization of industrial production. Notable among them is the agreement on collaboration in the field of improving concrete and reinforced concrete structures and the technology for their manufacture.

A basic objective in this collaboration is to utilize the experience of both countries in reducing the material, energy and labor expenditures to produce and use concrete and reinforced concrete structures in construction.

Within the framework of the agreement it has been planned: to develop efficient reinforced concrete structures which are uniform for the USSR and the GDR for one-story production buildings, operation lines and equipment for their manufacture, and to prepare joint proposals on the specialization and subcontracting of production and equipment; to conduct sampling and experimental testing of economical chemical additives for the concrete mixture with the aim of working out technical requirements and proposals for organizing their large-scale production; to develop highly efficient concrete and reinforced concrete heat-resistant protective structures for heat units; and to improve the technology for erecting buildings and structures of cast-in-situ [monolitnyy] concrete and reinforced concrete.

On the Soviet side, the USSR Gosstroy, USSR Ministry of Industrial Construction, USSR Ministry of Construction of Heavy Industry Enterprises, USSR Ministry of Construction, the Ministry of Construction, Road and Municipal Machine Building and the Ministry of the Chemical Industry are those that directly carry out the operations stipulated by the agreement. The NIIZhB [Scientific Research Institute of Concrete and Reinforced Concrete] heads operations of the USSR Gosstroy connected with solution of the tasks that have been set. A significant amount of the work is being carried out by the TsNIIPromzdaniy [Central Scientific Research, Planning and Experimental Institute of Industrial Buildings and Structures], and the TsNIIOMTP [Central Scientific Research, Planning and Experimental Institute of Organization, Mechanization and Technical Assistance in Construction] has been involved in operations connected with cast-in-situ concrete and robotics. From the construction ministries, specialists from the Glavpriokskstroy and KTI [expansions unknown] of the USSR Ministry of Industrial Construction, the EKB [experimental design bureau] of the USSR Ministry of Construction of Heavy Industry Enterprises, and the Giprostrommash [All-Union State Planning Institute of Construction Machine Building for Precast Reinforced Concrete] of the Ministry of Construction, Road and Municipal Machine Building are taking an active part in the operations. On the GDR side, the Ministry for the Construction Industry is the principal executor. The Institute of Industrial Construction, Betonoprojekt, the Institute of Reinforced Concrete, and the Combine of Light Concretes are taking an active part in the operations.

In carrying out the program of collaboration within the framework of the intergovernmental agreement, scientific research, planning and design, and production organizations of the USSR and the GDR have conducted an analysis, based on a unified procedure, of the level of development in both countries of reinforced concrete structures for one-story production buildings and have selected for joint development the structures of reinforced concrete building frameworks which are being used most widely in construction--prestressed columns without cantilevers up to 12.3 meters high and rafter beams with a span of 18 meters. In this case, development of prestressed columns is being carried out by specialists from the Soviet Union and development of reinforced concrete I-beams is being carried out by GDR specialists in accordance with the technical requirements agreed upon.

Specifications for the columns and beams indicated were prepared in 1981 on the basis of specialization and subcontracting of scientific research and planning and design operations. Albums of blueprints for the entire products list of these structures have been produced for practical application. At present, blueprints of prestressed columns with cantilevers for buildings with overhead cranes are being developed. Testing of the experimental models of such columns has been conducted by our specialists.

With the aim of overall resolution of the problems advanced, technical solutions of the production lines for manufacturing columns without cantilevers and beams have been coordinated by specialists from the USSR and the GDR. The procedure for their manufacture has been worked out on the basis of a thorough analysis of the industrial equipment available in the USSR and the

GDR. Through purposeful and well-coordinated work, testing of an experimental model of a heavy-duty coupled mold [silovaya sparennaya forma] for making columns without cantilevers was successfully carried out in November 1981 at the Shchekino ZhBI [Reinforced Concrete Products] Plant of the Tulzhelezbeton Trust of the USSR Ministry of Industrial Construction. Development of heavy-duty molds for the production of precast columns with cantilevers will be completed in 1984-1985. An experimental model of a heavy-duty mold for the production of beams was tested in June 1982 at the Institute of Reinforced Concrete of the GDR Ministry for Construction Industry. In the tests they used a vibrator with horizontal and circular oscillations which ensured a high degree of thickening in the concrete mixture.

At present, an arrangement has been reached on specialization in the production of equipment. In particular, production of equipment to make columns will be organized in the USSR and equipment for making beams will be organized in the GDR. The GDR Ministry for Construction Industry has pledged to manufacture and deliver to the USSR 35 complete sets of molds for the production of beams. In turn, the USSR Gosstroy and the USSR Ministry of Industrial Construction will provide for the organization of manufacturing for GDR plants of 10 complete sets of molds for the production of columns without cantilevers. In conformity with recommendations of the Ninth Conference of the Coordination Council, the USSR Ministry of Industrial Construction, the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Construction and the GDR Ministry for Construction Industry introduced proposals in September 1982 to the appropriate planning organs for reciprocal deliveries in 1983-1984 of the prototypes and industrial batches of the equipment indicated above.

Wide use in capital construction of the new efficient columns and beams will make it possible to achieve significant savings in materials and the inputs of work time for their manufacture. Thus, when the columns are introduced, a reduction of labor expenditures by 10 percent and of steel input by 20 percent will be ensured. Introduction of the jointly developed beams with 18-meter spans by means of selecting the best cross-sections [secheniya] will make it possible, in comparison with the standard lattice beams of the 1.462-3 series widely used in the USSR, to reduce the input of reinforcement for one item by 141 kilograms, the input of concrete by 0.9 cubic meters, and labor inputs by 12 percent. In this connection, the new jointly developed beams, under the entire range of stresses in the long term, will replace in construction the less economical lattice beams of the series cited.

Just in connection with the planned siting at domestic construction industry enterprises in 1984-1985 of the 35 jointly developed, highly mechanized molding installations (20 for the USSR Ministry of Industrial Construction, 10 for the USSR Ministry of Construction of Heavy Industry Enterprises, and 5 for the USSR Ministry of Construction), the annual economic gain as a consequence of the output of new economical rafter beams will amount to 1.33 million rubles, the savings in steel will amount to 2,467 tons, and the savings in concrete will be 15,750 cubic meters.

Recently, research has been conducted to further improve the construction of roof slabs and beams, taking collaboration on them into account. Based on analysis of design solutions, blueprints of an experimental model of a roof fragment with couplings [fragment pokrytiya s sopryazheniyami], carried out by means of the cast-in-situ method [zamonolichivaniye] were drawn up. The model mentioned was manufactured and tested in July 1982 at the Institute of Reinforced Concrete of the GDR Ministry for Construction Industry. Results of the tests confirmed calculations on the significant increase in rafter beam supporting capacity with roof slabs when collaboration is ensured, which will make it possible to increase beam supporting capacity by 20 to 30 percent and reduce steel input by 8 to 12 percent. Taking this into consideration, a decision was made to test a similar fragment, but with a welded version of the coupling, at the base of the Orgtekhstroy [expansion unknown] of the LSSR Ministry of Construction.

Important and beneficial work has been carried out under the concrete research program with the use of superplasticizers made in the USSR (S-3) and the GDR ("Viksoment"). Specialists from both sides have exchanged instructional materials on the use of these ingredients for the manufacture of pipes in the USSR and road surfaces and flooring in the GDR. In the near future, joint research will be conducted which is aimed at creating more economical chemical additives based on lignosulfates, for the production of which a good raw material base is available both in the USSR and the GDR.

Development of multilayer protective structures for heat units using reinforced concrete and fibrous heat insulation materials has been completed, which will make it possible to ensure wide use of prefabricated elements in the construction of tunnel-type furnaces and the manufacture of small rail cars in the construction materials industry, to double or triple labor productivity in the process, to reduce the cost of construction operations by 60,000 to 80,000 rubles per furnace, and to reduce the input of refractory materials by 30 percent. The savings in fuel in the tunnel furnaces will amount to 10-15 percent and reduction of labor input to maintain the rail cars will amount to 15-25 percent. At present, work is being completed on technology for the manufacture of these structures. Output of a test batch of multilayer panels has been specified in 1983 at the Novokuybyshevsk base of the Tepломontazh Trust of the USSR Ministry of Installation and Special Construction Work.

Specialists from both countries have begun joint operations to improve the technology for erecting buildings and structures of cast-in-situ concrete and reinforced concrete. It is planned to conduct similar measures in 1983-1984 in relation to equipment for the manufacture, transportation and pouring of concrete and for the centralized plant manufacture of reinforcement items.

At the Coordination Council meeting a decision was made to collaborate in the creation of robot-manipulators which are being used at concrete structure plants. In addition, an understanding was reached to exchange specific proposals on operations in this field being planned in both countries and to determine the subject matter for joint developments.

Taking into account the recommendations of the 35th CEMA meeting for further improving the efficiency of collaboration and on the responsibility of production, scientific research and planning and design organizations for the end results of jointly conducted operations, the sides have begun converting these operations to fulfillment in accordance with contracts and direct agreements between the executing organizations.

All operations of the Coordination Council within the framework of the Intergovernmental Agreement are being carried out in conformity with the requirements of the USSR Council of Ministers decree No 652 of 9 July 1981 "On further improving the collaboration of ministries and departments of the USSR, associations, enterprises and organizations with the corresponding organs, enterprises and organizations of other CEMA member countries in the field of science, technology, and international specialization and subcontracting of production." The results of collaboration will contribute to further improvement in quality and reduction of cost and labor inputs, savings in material and energy resources in construction, and to the development of mutually beneficial economic and scientific and technical ties between the USSR and the GDR.

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## CONSTRUCTION PLANNING AND ECONOMICS

### PROBLEMS WITH SUPPLY INDICATORS, INEFFICIENT EQUIPMENT USE NOTED BY GOSSNAB

Moscow EKONOMICHESKAYA GAZETA in Russian No 35, Aug 83 p 6

[Article by N. Burukhin, director of the Krasnoyarsk Main Territorial Administration of the USSR Gosplan: "What Do We Consider an Objective Evaluation?"]

[Text] Today our administration provides the kray's major building sites and construction organizations with materials. This includes the excavator plant complex, the Achinsk Petroleum Processing Plant, the "Abakanvagonmash", and numerous other facilities. Under these conditions, the requirement of overall economy of material-technical resources is given first priority. It is specifically this which disturbs us most today, and it is specifically this toward which we aim our entire collective and all our subsections.

We conduct supply services using the so-called limit-credit cards, in which we consider the operative and real aspects of the project's readiness. We create conditions for the operative control of the expenditure of material-technical resources. In the case of unsatisfactory delivery in transit, we can help a specific construction site by delivering the necessary materials from our own bases.

A similar type of relationship has been formed, for example, between the Krasnoyarskglavsnab, Glavkrasnoyarskstroy, Krasnoyarsksel'stroy, Krasnoyarskvodkhoz, and other leading construction organizations in our region. All this ultimately made it possible this year under conditions of irregular delivery of small-piece rolled stock by the metallurgical enterprises to ensure the supply of construction organizations with the necessary resources. These, in turn, were able not only to fulfill, but even to exceed the five-month plan for the introduction of residential housing.

At the beginning of the current five-year period, the specialized "KATEKsnab" administration was created within the system of our territorial administration. It took on the basic functions of providing material resources and realizing funds allocated for building to the construction subsections of the USSR Minenergo [Ministry of Power and Electrification] and the USSR Minugleprom [Ministry of the Coal Industry] participating in the creation of the KATEK facilities. In all fairness, we must say that we were not the pioneers in introducing this form of supply provision. Our specialists first thoroughly studied the operational experience of supply to such now well-known building sites as "Atomnash" and "KamAZ".

Such a form of work with the construction site makes it possible not simply to maneuver the resources but, working according to the principle of weekly and daily planning, to know the needs of each specific construction brigade. This is a sure means of economical expenditure of material-technical resources, particularly if the brigade contract is in effect at the site. Material-technical resources were delivered in a centralized manner to the facilities under construction which had the necessary construction readiness. All this yielded great effect.

Nevertheless, a paradoxical situation was created. The "KATEKsnab" administration, having achieved significant effect, still did not fulfill its basic plan indicator -- the plan for goods turnover -- and its collective did not receive a prize.

What has happened? On one hand, the new form of material provision organization has made it possible to rationally utilize resources, while on the other hand the presently existing system of planning the basic indicator for the work of the supply and sales organization fully refutes the need for their rational application. In order to fulfill the plan for goods turnover, the "KATEKsnab" administration must immediately pass on to the builders all the materials delivered to its bases, regardless of the actual need or readiness of the facility.

Evidently, the need has arisen to replace this indicator with another one which would stimulate the work of supply organizations according to the rational application of material-technical resources and their issuance according to the construction readiness of one facility or another.

Experience has shown that one of the reasons for the sometimes weak interaction of the construction site with us is the untimely presentation of precise title lists of new construction projects submitted by the enterprises being built for the plan year.

We do not need to search far for examples. In this year alone at the end of the second quarter the "KATEKenergopromstroy" association was unclear on the construction of two major standard equipment bases at the site of the Berezovskiy GRES-1 [State Rayon Electrical Station] in the city of Sharypovo. By the end of the first six months, the complex under construction at the "Sib-elektrostal'" Plant had not been confirmed. Nevertheless, these facilities are shown as being under construction in the plans for the five-year period.

Here is another question. Often the builders work arrhythmically: someone lags behind, someone disrupts the schedule. However, the materials and the equipment for the facility are already at the bases or construction sites, while nearby there is a site which is ready to accept such equipment. It seems logical to redistribute the resources and to complete the facility which is almost finished. However, the site belongs to a different ministry and the Main Territorial Administration of the USSR Gosnab [State Committee for Material and Technical Supply] does not have the right to perform such re-

distribution. Tens of official papers must be written in tens of instances. However, the ministries and departments will find sufficient arguments to decline.

This is why three strip conveyers lie idle since 1974 at the Krasnoyarsk Aluminum Plant and why three overhead grab cranes and a hundred control panels have been in storage for eight years at the Achinsk Aluminum Oxide Combine. Two years ago the Krasnoyarsk Tire Plant, whose construction is laid up for many years, received 4.5 million rubles of equipment for production as well as having over a million rubles worth of equipment left over due to changes in project decisions. Our appeal to the USSR Minneftekhimprom [Ministry of the Petroleum Refining and Petrochemical Industry] with a request to take appropriate measures for redistributing the above-norm reserves remains unanswered.

Evidently, certain time limits should be established, after which above-norm and uninstalled equipment may be redistributed by the territorial supply organ to other facilities whose operational readiness evokes no doubt.

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## CONSTRUCTION PLANNING AND ECONOMICS

### FINANCING RELATIONSHIPS IN CONSTRUCTION INDUSTRY EXAMINED

Moscow FINANSY SSSR in Russian No 9, Sep 83 pp 43-48

[Article by M. P. Berezina, candidate of economic sciences, and T. F. Zemskova, All-Union Correspondence Finance and Economics Institute]

[Text] The 26th CPSU Congress defined an awesome building program in all spheres of the advanced socialist society, one whose fulfillment depends in large part on consistent improvement of the economic mechanism. It calls for further development of cost accounting (khozraschet) on the basis of assignments of the 5-year plan and long-term economic norms and for improvement of pricing, credit financing and financing in general. These problems are also acute in the construction sector. At the November (1982) Plenum of the party's Central Committee it was emphasized that establishing order in capital construction is one of the central tasks in the national economy. There as in other sectors of the economy the interrelated set of measures envisaged by the decree of the CPSU Central Committee and USSR Council of Ministers dated 12 July 1979 is being introduced during the 11th Five-Year Plan. It is important to emphasize that these measures were drafted in the course of thorough theoretical investigations, broad economic discussions, and experiments conducted in advance during the 10th Five-Year Plan. The Belorussian experiment, which began in 1975 in BSSR Minpromstroy [Ministry of Industrial Construction] and Minmontazhspetsstroy [Ministry of Installation and Special Construction Work], and thereafter in other ministries and departments of a number of union republics, was to be the most effective among them.

The economics research and experiments were aimed at a more complete orientation of the system of economic activity of every participant in construction toward attainment of the end results--activation of capacities and projects on time, to a standard of quality, at minimum cost, and in a coordinated way (in mutual linkage with development of related production operations and the infrastructure). That is how the finished design product came to be introduced as an indicator for project planners and the marketable construction product for organizations operating as contractors. Organizations figuring as customers are assigned analogous targets. Yet from the standpoint of meeting the requirements of the economy the possibilities have not been exhausted for improving the indicator of construction's finished product.

In housing and public works construction determination of the finished product in the form of blocks of development, including complexes of residential buildings and also facilities for municipal, consumer, social and cultural services, is promising. Planning, designing, evaluation of performance, financing and settlement on the basis of blocks which have been completed and provided full amenities would help to solve the problem of comprehensive development of new urban residential areas. Units of the finished product should be envisaged in connection with development of construction of industrial parks. The mechanism for the conduct of economic activity can, of course, be brought into conformity with the proposed indicators if the necessary prerequisites are created for this.

Many of the changes outlined in the economic operation of entities involved in construction have already been made, especially in the construction industry proper and in project planning and surveying organizations. Among them an important role is being played by strengthening the influence of finance and credit on development of production and on improvement of qualitative indicators. We should note the definite constructive results from performance of measures being introduced in accordance with the decree of the party and government referred to above. They include the tendency outlined for strengthening the concentration of resources, which is manifested in reduction of the number of sites and projects under construction at the same time, including new sites and projects; an increase in the relative share of the program of work done on projects near completion; a higher level of plan fulfillment for those operations than for operations in general; a higher growth rate for the delivered product than for the gross volume of work done; and a substantial decrease of construction not covered by the plan and other forms of "wildcat" construction. As a result activation of fixed capital has increased, the average erection time of production facilities has been reduced by more than half a year from what it was in 1970,<sup>1</sup> the growth of unfinished construction, whose level had reached 86 percent of the annual volume of capital investments by the end of 1981 and 91 percent at the end of 1979, was halted.<sup>2</sup>

Many construction subdivisions in the country have substantially improved their performance. For example, the Trust "Tomsksel'stroy," which has been carrying out the new measures since the second half of 1980, fulfilled the principal technical-and-economic indicators for the period 1980-1981 and the first half of 1982. Over that period the total number of projects under construction dropped from 190 to 155, approximately half of the projects near completion were activated ahead of schedule, and all projects delivered for operation were classified "good" (khorosho). The Combines "Dneprot'yazhstroy" and "Dneprometallurgstroy," which are primarily engaged in construction of production facilities, achieved a 25.8-percent reduction of project construction time between 1980 and 1982.

Financial and credit levers have tended to improve production indicators: they include settlement between customers and contractors for enterprises, stages of construction, complexes and facilities capable of independent operation on which construction has been entirely completed and which have been completed for operation at the estimated cost of the marketable construction

project, the fundamentally new system for formation of working capital of contractors and project planning organizations, which provides for a strengthened role of credit, improvement of the formation and use of profit and economic incentive funds, an increase in the relative size of bonuses for activation of production facilities and projects on schedule, etc. At the same time in economics there are practically no final solutions, and new problems are constantly coming into being. As experience shows, they have also arisen during the development of financial and credit relations. Some deserve particular attention and in our opinion require an urgent solution so that the effectiveness of the entire economic mechanism and of its impact on production can be increased.

Such problems exist in the domain of the formation and use of profit and working capital in construction, which have been subject to the greatest changes as the economic mechanism has been improved. It is important to note that these categories are more closely related than in other sectors with the purposes covered by the credit, with the procedure for the authorization and repayment of loans, with credit incentives and penalties, with the interest on credit, etc. In other words, under present conditions many financial and credit relations are intertwined in construction. We will examine in more detail the questions that have been raised,<sup>1</sup> above all the formation and distribution of profit.

Profit is one of the basic factors in the development of production. On the one hand it expresses the economic efficiency of the business activity of enterprises, while on the other it is a source for the expansion of production and for material incentives of collectives. In recent years the profit of construction contractors has undergone important quantitative and qualitative changes. First of all, in the entire set of numerous factors influencing its size and dynamic behavior those factors have been dominant which brought about a reduction of the role of profit in all aspects: as an indicator of the efficiency of the construction process, as an economic incentive of the growth of production, and as a source for the socioeconomic development of the sector as a whole and its individual business units. This had in turn an effect on the development of financial relations, held back the introduction of progressive forms and methods of their organization (self-financing in particular) and reduced possibilities for the use of finance to intensify the construction industry proper.

Second, introduction of the new economic mechanism in construction on the one hand created the conditions for enhancement of the role of profit and on the other it gave rise to a number of new phenomena in its formation and use. For example, the qualitative heterogeneity of profit has increased; this is manifested in the present existence of several varieties of profit which have differing sources and are related to the results of the construction process in differing degrees. As a consequence financial relations in the sector have become excessively complex, the financial condition of construction contractors has become less stable, and higher requirements need to be met to ensure the conjugate effect of the financial credit mechanisms. We will illustrate these conclusions with specific cases.

Now that settlement is made for the marketable construction product, the profit of construction contractors has taken on a different content. To obtain it one must deliver to customers finished enterprises and complexes and projects capable of independent operation. At the same time expansion of the use of this kind of settlement in the 10th Five-Year Plan, resulting from extension of the Belorussian experiment, was one of the reasons (along with the rise in the prime cost of operations and so on) for the drop in the absolute size and relative proportion of profit. As unfinished construction grew (14-fold between 1970 and 1980)<sup>5</sup> there was a reduction of profit from delivery of work in the balance sheets of construction contractors as the system developed in which settlement is made for completed enterprises and complexes and facilities capable of independent operation. This tendency has been intensified in the 11th Five-Year Plan as the conversion to settlement for the finished construction product has been completed. In the period 1976-1980 the average growth rate of the reduction of the absolute size of profit was 3.1 percent, in 1981 it was 3.2 percent.<sup>6</sup>

The drop in the profitability of the construction process as a whole (from 15.9 percent in 1975 to 11.4 percent in 1980 and 11.7 percent in 1981) has been accompanied by a differentiation of its level from one construction ministry to another. For instance, the amplitude of the fluctuation of this indicator was 21.6 points in 1971 and 35.7 points in 1981. In 1971 the lower level of profitability was 4.1 percent in USSR Minsel'stroi [Ministry of Rural Construction], and in 1981 it was 1.4 percent in USSR Ministroy [Ministry of Construction], while the highest was in USSR Minmontazhspeksstroy--25.7 and 37.1 percent, respectively.<sup>6</sup> As a result the latter ministry, which includes 7.5 percent of all the country's state construction contractors, now accounts for more than one-third of the profit of the construction industry proper.

The increase in the sector's need for financial resources, which occurred simultaneously with the reduction in the level of profit, led to a sharp reduction of the share of this sort in financial resources. For instance, in the years of the 5-year plan the relative share of profit in the total volume of "own" planned financial resources increased 2.3-fold for USSR Minsel'stroi, 2.2-fold for USSR Ministroy, and 1.6-fold for USSR Minpromstroy. This has meant a narrowing of the sphere of application of the cost-accounting basis for financing outlays for development of the construction industry proper and also a reduced opportunity for the influence of financial levers which come into play in the process of the distribution of profit. For example, whereas in 1975 the share of profit among sources of financing capital investments was 9.1 percent in USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises], 8.5 percent in USSR Ministroy, and 7.4 percent in USSR Minpromstroy, in 1981 the respective figures were 0.1, 0.2 and 0.2 percent. The relative share of profit in formation of the production development fund dropped over that period from 28.6 to 5.3 percent in USSR Mintyazhstroy, from 28.6 to 11.9 percent in USSR Minpromstroy, and in USSR Ministroy from 26.3 percent to zero. Its share in the material incentive fund also decreased.

In most all-union construction ministries there has been a reduction in payments into the budget from profit realized in contracting. In USSR



Minpromstroy they dropped to ten twenty-thirds of what they were, in USSR Mintyazhstroy to one-fourth, and in USSR Minstroy to five twenty-thirds. In subdivisions of these ministries (BSSR Minpromstroy, UkSSR Mintyazhstroy, and LSSR Minstroy) converted in connection with the conditions of the Belorussian experiment to the normative procedure for profit distribution, no payments at all were provided for in the financial plan for 1981.

All of this is indicative of the tendency that exists toward a reduction of the role of profit as an incentive in the cost-accounting activity of construction contractors. One of the most important reasons for this situation lies in the fact that the standard rate of planned accumulation set more than 10 years ago does not afford most construction ministries sufficient profit for the normal functioning of financial and credit levers in the context of improvement of the economic mechanism. Many economists are pointing to the need to raise its level. In the opinion of certain authors, the rate of planned accumulation must be at least 13.3 percent.<sup>7</sup> It would also seem advisable to change the pricing methodology, in particular the base against which accumulation is calculated, in order to eliminate sharp fluctuations of profitability from ministry to ministry depending on their specialization.

Under present conditions of the stronger orientation of the system of economic activity in construction toward the final results the problem of the interrelationship between the receipt of profit and the moment when the sales transaction takes place has become more acute. The present practice of determining the sales indicator on the basis of delivery, rather than on the basis of payment for the marketable construction product has the result that one can distinguish two independent parts in the total amount of profit: profit received (for projects which customers have paid for) and profit which has been credited, but which has not been received (for projects on which bills have not yet been paid: whether or not they have been submitted to the bank).

Judging by the relationship between the construction product delivered and its unpaid portion (with certain reservations), the share of profit not received is quite sizable in the total amount reported. For example, in BSSR Minpromstroy the ratio of accounts payable by customers according to report balances to the volume of marketable construction product, expressed as the cumulative total from the beginning of the year, was 64.6 percent as of 1 July 1980, 35.6 percent as of 1 October, and 46.8 percent as of 1 January 1981. Consequently, the total profit reflected in the report of construction contractors, which performs the function of an indicator of production efficiency, and the profit actually received--which is the source of money funds--do not coincide in quantitative terms.

In spite of this total profit is subject to distribution and use, which means that "own" working capital is diverted to outlays which are financed from profit, which means that there is a greater shortage of "own" working capital relative to the minimum requirement. We need to note that a certain portion of profit on projects delivered, but not paid for by customers, assuming bills for them are promptly submitted to the bank, does have money coverage in the form of credit, since the total amounts of these bills are included in the consolidated purpose of credit secured by work in process.

But according to the available figures, under the new conditions of planning and settlement on the average about 30 percent of billings (estimated cost) are submitted to the bank late. This is mainly because defects and oversights are being corrected and the estimate documentation is being made out once again. Moreover, in many cases the bills are submitted to the bank after the 30-day period following delivery of the projects. As a result a sizable share of customer indebtedness is not being made up for with credit, and the portion of profit corresponding to it is not furnished by the presence of money funds in the circulation of construction contractors.

There is accordingly a need to put order more quickly into the method of determining the volume of sales of the construction product to bring it into full conformity with the economic mechanism being introduced. In particular, as has been repeatedly proposed in the economics literature,<sup>2</sup> there is a need to extend to construction the general rules that apply to evaluation of performance, in which the sales transaction is recorded as of the moment when the proceeds arrive in the accounts of construction contractors. This would make it possible to strengthen the interconnection between the final results of production and the financial results of performance--the marketable construction product and profit, to eliminate the contradiction that now occurs when the formation and use of proceeds and profit anticipate their receipt.

From our point of view one might recommend as a temporary measure the identification of profit received in the reporting of construction organizations, which would make it possible to be guided only by the given profit when deductions from it into the budget are being calculated, when economic incentive funds are being credited, and when other outlays are being financed under the financial plan, rather than enlisting "own" working capital for those purposes. At the same time determination of the existence of "own" and equivalent working capital solely on the basis of the profit received will characterize its size more authentically.

The system for formation of working capital has also undergone substantial changes under the influence of the development of progressive forms of settlement for the construction product. Bank credit has become the principal source of working capital, now making up more than 70 percent of its total amount. This fact resulted from the change in its composition and structure and also from the transition to building up construction work in process with credit. The advantage of the credit method of advancing working capital lies in the fact that it is more mobile and flexibly detects fluctuations in the process of construction work, which, as is well known, is distinguished by great lack of uniformity. At the same time construction contractors are guaranteed that resources will be furnished in accordance with progress in fulfillment of the plan, and there is assurance that the sphere of bank supervision will be expanded in construction, since its effectiveness is far greater than that of customers.

On the whole the financial condition of construction contractors over the period since the beginning of the 10th Five-Year Plan has been characterized by a substantial deterioration. The sum total of nonpayments to the bank, to suppliers and to subcontractors in percentages of the volume of contract work

(annual average) increased twofold between 1975 and 1981 in USSR Minstroy, 2.2-fold in USSR Mintyazhstroy, 1.7-fold in Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], 1.6-fold in USSR Minpromstroy and USSR Minenergo [Ministry of Power and Electrification], and 1.5-fold in Mintransstroy [Ministry of Transport Construction]. Only in USSR Minmontazhspetsstroy did this indicator drop to two-thirds of what it was. In our view one of the reasons why this situation came about is that because of the successive consolidation of the settlements, the financial condition of construction contractors became more closely dependent on the level of fulfillment of production indicators. Earlier and especially when intermediate settlements for work items completed predominated and the costs of work in process was covered by the method of advances, a paradoxical situation came about of apparent financial prosperity of construction contractors when plans were not being fulfilled with respect to production indicators, including failure to meet construction deadlines, the rise in the prime cost of operations, and a drop in growth rates of labor productivity.

Adverse factors in the formation of "own" and borrowed resources have also had a substantial impact toward deterioration of the ability of construction contractors to make payments. We should include among them first of all the drop in the preservation of "own" working capital and also a drop in the capital employed in the operating cycle, which resulted in large part from the drop in the profitability of the construction process, nonfulfillment of the profit plan, and adverse aspects of the formation and use of profit. The average annual size of the shortfall of "own" working capital relative to the minimum requirement increased over the period from 1975 to 1981 from 6.3 to 41.8 percent in USSR Mintyazhstroy, from 17.3 to 54 percent in USSR Minstroy, and from 13.5 to 56.2 percent in USSR Minpromstroy. The number of organizations not meeting the minimum requirement within these ministries at the end of 1981 was 55, 43 and 52 percent of their respective totals.

The favorable shifts which have been outlined in capital construction and the measures to improve the formation and use of profit in its various present forms in the construction industry proper whose advisability has been argued above should help to improve the condition of "own" working capital. It would also seem indispensable to change the system for reimbursement of "own" working capital spent by construction contractors. Taking into account the ramified nature of this issue, whose full examination lies outside the purview of this article, we will note only the urgency of enhancing the role of the reserve for financial aid of ministries and to put order into its formation in accordance with the requirements of the subordinate organizations of general construction ministries.

At the present time profit is the basis for formation of the reserve, which means that the ministries have unequal opportunities for accomplishing maneuvers with working capital. For example, in USSR Minmontazhspetsstroy, where a surplus of "own" working capital is formed every year in the proportion of 16-20 percent of the minimum requirement, the financial aid reserve represents 3.8 percent of the minimum requirement of "own" working capital, and in USSR Minenergo it is 5.8 percent. In general construction ministries receiving small profit and spending a sizable portion of this capital, its

proportion does not exceed 1 percent: 0.5 percent in USSR Mintyazhstroy, 0.7 percent in USSR Minpromstroy and 0.7 percent in USSR Minstroy. That is why we concur in the opinion of economists who feel that the financial aid reserve of ministries, given its functional purpose, must be built up as a proportion of the minimum requirement on "own" working capital.<sup>3</sup>

There are also certain adverse aspects in formation of the working capital of construction contractors on the basis of bank loans. Under present conditions credit is the principal source (up to 90 percent) of their working capital represented by construction in process and in the sales stage. However, a portion of this capital is not covered by an advance in the form of credit, which is an impediment to the continuity of the circulation of capital. This applies above all to capital invested in expenditures for which credit is not extended. In the years of the 11th Five-Year Plan which have passed these expenditures have dropped considerably in the construction industry proper, but they still represent an impressive figure of more than 2 percent. A major portion of them are made on projects which have not been accepted for financing for various reasons, and in large part their reduction is related to improvement of the effort of construction organizations in the fields of economic statistics and claims.

In certain main construction administrations a great deal of attention is being paid to this. For example, in August 1981 Glavarkhangel'skstroy issued an order for closer supervision of the punctuality and completeness of the credit financing of expenditures represented by work in process in construction. It called for managers of construction organizations to examine on a monthly basis the makeup of work in process and to take steps to eliminate and prevent expenditures not covered by credit. The question of the practice of applying financial penalties for performance of operations on projects not included in the plan and not accepted for financing was taken up in the collegium of Glavsreduralstroy in 1981. As a result the diversion of capital into outlays on such projects was reduced to a fraction of what it previously had been. It would seem advisable for construction ministries to show a great deal of initiative in this effort and to see that it is purposive and unified in subordinate subdivisions.

A sizable share of outlays not covered by credit, rather often the major share, have to do with projects on which construction has been finished, but the settlement documents concerning them have not been submitted to the bank within the prescribed period, and for that reason their credit coverage has been discontinued. In a number of cases the late submittal of bills has occurred through the fault of client organizations, since settlement for construction and installation work is mainly made in the form of drafts. Bank institutions should tighten their supervision in order to prevent this, and a procedure should also be instituted whereby clients would reimburse construction contractors for losses in approximately the same proportion as for late payment of bills, i.e., 0.04 percent of the total amount of the bill for each day payment is late.

Yet the principal reason for the late submittal of settlement documents is that projects are being delivered with certain items unfinished, and then



their elimination is prolonged. In our opinion, an important reason for the latter is that the individual elements in the economic mechanism are not coordinated: planning, evaluation of performance, finance, and credit financing. For instance, fulfillment of the plan for activation is evaluated on the basis of documents on acceptance of completed projects signed by the state acceptance commission and duly approved; fulfillment of the plan for the marketable product is evaluated according to housing and public works construction projects and certain other projects in an analogous way, while for industrial projects evaluation is based on documents signed by the commission indicated. Consequently, under the present procedure the estimated cost of the marketable construction project as planned and actually occurring by enterprises (projects) for productive purposes (and they represent the major share of construction) does not correspond to the estimated cost of construction and installation work on projects among those activated.

It is also important to take note of this factor. Superior organizations in the construction industry proper and financial and statistical agencies do not stipulate the deadline for submittal of settlement documents on the delivered product. The practice is that bills on projects delivered in the past month must be submitted to the bank by the time the bookkeeping balance is submitted for that month, i.e., approximately in the middle of the next month, sometimes even later. The specific deadline for submittal of documents is set only by the bank--no later than 5 days after the signing of the acceptance documents (5 days after their approval on housing and public works projects).

In cases when deadlines are not met bank institutions require that the value of construction and installation work done on the relevant projects be omitted from the actual volume of the marketable product, but frequently they are not successful in this. For example, as of 15 July bills had not yet been submitted because of unfinished items on nearly half of the housing and public works projects activated in the first half of 1982 in Leningrad Oblast. The Leningrad office of Stroybank raised the question with the statistical administration of correcting the reports, but not a single project was omitted. This kind of lack of coordination has the result that so far construction organizations have not yet built up an internal economic system for obtaining the money "earned." Most of the economic and administrative levers "operate for acceptance," and, as shown above, they do so disjointedly. Which furnishes one more argument in favor of the need for very urgent solution of the problem of the authentic sales result in construction.

It also seems advisable to coordinate more closely supervision over the final results of construction on the part of various agencies, establishing a uniform procedure for planning and recording in statistical reports the figures on activation and marketable product and for adherence to deadlines for submittal of settlement documents on the projects delivered. These deadlines need to be specifically stated in the instruction on procedure for compiling annual reports concerning capital construction.

Thus measures to improve the economic mechanism, including the financial and credit mechanism, are yielding a still more appreciable benefit in construction. At the same time, in the process of their practical application new

problems have arisen and certain outstanding problems have become more acute, mainly in the domain of the formation and use of profit and working capital. Their examination by the proper policy-making bodies, including the construction ministries and departments, and implementation of the proposals set forth in this article, will in our view make it possible to raise the level of effectiveness of financial and credit relations in construction.

#### FOOTNOTES

1. M. Zetov, "The Ruble in Circulation," PRAVDA, 28 October 1982.
2. "Narodnoye khozyaystvo SSSR, 1922-1982" [USSR National Economy, 1922-1982], Moscow, "Finansy i statistika," 1982, p 377.
3. These points apply mainly to the construction industry proper, although because of the similarity of the measures to be carried out, they are also relevant to project planning and surveying organizations.
4. Calculated from the figures in the statistical yearbook "Narodnoye khozyaystvo SSSR v 1980 godu" [USSR National Economy in 1980], Moscow, "Finansy i statistika," 1981, pp 510, 516.
5. Calculated from the figures in the statistical yearbook "Narodnoye khozyaystvo SSSR, 1922-1982," Moscow, "Finansy i statistika," 1982, p 549.
6. Here and hereafter the figures are given on the basis of reports of construction ministries.
7. M. B. Podnos, "On Planned Accumulation in Construction," EKONOMIKA STROITEL'STVA, No 8, 1982, p 56.
8. P. D. Podshivalenko, "Razvitiye khozyaystvennoy reformy v stroitel'stve i finansy" [Finance and Evolution of the Economic Reform in Construction], Moscow, "Finansy," 1976, pp 88-89.
9. T. V. Selezneva, "Financial Reserves in the Cost-Accounting System of the Sector," FINANSY SSSR, No 4, 1981, p 19.

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ENGINEER SUGGESTS WAYS TO ALLEVIATE PLANNING BOTTLENECKS

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 5, May 83 pp 57-60

[Article by A. Mikhel', engineer, "Plan Flexibility and Production Continuity"]

[Text] One of the greatest bottlenecks in construction planning, organization and management is the problem of providing continuity of operations and production processes. It is not by chance that up to now work loads in construction sections are irregular, according to the month of the year, and placing new units into operation occurs unevenly. Primarily, this takes place in the fourth quarter. The causes giving rise to such practices are many. However, we will dwell on only a few of them.

For simplicity of discussion it is expedient for us to divide the participants in the investment process (construction conveyer) into two large groups. In the first production group are general contracting and sub-contracting organizations, suppliers, plants - manufacturers of construction materials, central administrations and associations. In the second group (plan control group) are enterprises and client's organizations, architectural construction services, design organizations and organizations issuing technical specifications for power supply, telephone service, sewage, water supply, etc., in short, producers of technical specifications. They participate, as a rule, in inspection and operation of the systems.

If we attempt to determine the actual contribution of each participant in the construction of a typical 70-apartment building or group of apartment buildings, we obtain the following data on the percentage of total estimated cost (with the exception of equipment cost).

Table 1.

Participants in			
No	Investment Process	%	Work Accomplished
1	Contractor	97	Construction-erection
2	Client	1.8	Technical inspection and equipment acquisition
3	Designer	1.1	Cost for design work
4	City Architect	0.08	Zoning, layout, executive plan

5	Producers of Technical Specifications	0.04	Standard costs for developing development systems and issuance of technical specifications (not considered in estimate)
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Total cost 100

This table, however, cannot give a full picture of the important significance of decisions of each of the participants in the investment process on the final results. In order to fill it in an analysis must be conducted of the proceedings of the meetings of the Tselinograd City Coordinating Staff on Construction of Residences and Cultural and General Buildings. The results of this analysis are presented in table 2. For 100 percent, the entire number of cases of adverse effects of disagreements between the general contractor and the basic planning group are included. (Disagreements within the first group are not examined in this table, since it is the topic of another article.)

Table 2.

No	Participants in Investment Cycle	Proportion of Adverse Effects, %	Description of Adverse Reaction Factors
1	Contractor	10	Change in methods of production operations and technology, specified by the project, in connection with material substitutions, construction, and materials used.
2	Client	30	Change in plans. Substitution of equipment and materials not in plans. Use of structures in the project not manufactured by the general contractor. Sending complete revisions and adjustments to the contractor. Change in system terminals.
3	Designer	10	Errors in standard designs in surveying, engineering and hydro-geological surveys.
4	City Architect	24	Changes in zoning, public welfare and the general plan, in facade finishing.
5	Producers of Technical Specifications	26	Changes in technical specifications to engineering services.
	Total	100	

It is impossible to confirm if these data are absolutely accurate, but the trend they reveal is true, and they permit to draw one important conclusion from that presented in the table above. The greatest proportion of adverse consequences for construction falls to the share of those of its participants whose contribution to creation of the final product is least.

If, to that stated above, we add the fact that he who economically "lets the grass grow under his feet" in construction does not answer for his actions, then it becomes evident: such a system of production relationships between partners is not responsive to the interests of business.

Certainly, a similar-type of reorganization is far from simple. It has to affect, and perhaps somehow reorganize, participants in the investment process of the second group. The course for intensification of production for all possible economy of all resources, including, above all, resources of time and labor, requires each to answer for his own actions (or lack of thereof) to his neighbor's money. But individual measures of administrative actions cannot achieve mutual responsibility.

Along with this, individual economic sanctions are also insufficient for basic changes in the situation. Other measures are necessary. In fact, the negative consequences already mentioned may exist not only in irresponsible relationships, but also in completely serious relationships between participants in the second group and the overall affair. The origins of many subsequent problems are often concealed, in particular when several years pass, as a rule, from the compilation of initial data for design of a specific item to beginning of construction.

Time passes in preparing the basic designs, in the many-faceted coordination and solution of sundry problems (project consultations, search for sources of financing, available contractors, etc.). As a result, prior to beginning work it is uncovered that, let us say, the object is connected to the heat path not quite at the location provided for by the plan. Similar discrepancies indicate the same: for solution of the "unexpectedly" arising problem it is additionally required to excavate trenches, try to find pipes, prefabricated reinforced concrete and thermal insulation materials.

The same could be grouped with the remaining engineering system, with new requirements of architectural appearance of the build-up of the area and many others. Inasmuch as there are at least dozens of residences and cultural and general buildings under construction in large cities, the number of similar-type discrepancies is usually sufficiently large. At the same time it is not strange that all of them, in essence, are "legalized" by the plan. But, actually it would be impossible to take into account ahead of time the constituent new specifications in previous projects (on the basis of which the plan was built).

Insufficient flexibility in planning and its insufficient focus on achieving solid results is one of the greatest deficiencies in our work. How can we compensate for it?



The solution of these problems is envisioned in the development of an operational engineering-economic plan for city development for a two-year period, in which we can determine where, when and how to build, in detail.

In the first stage it is necessary to analyze work for the preceeding 5 years (or for another planning time interval), the purpose of which is to determine factually the total amount of civil housing for the city as a whole (regardless of dependence on bureaucratic subordination of builders or contractors), and also to refine data on the amount of capital investments and erections, cost per square meter of living space, number of residences, applicable wear, structure of brick, cinder block, and bearing-wall apartment houses in the overall volume of construction, capacity of contracting organizations and other data serving as a foundation for sufficiently well-founded relationships.

In the second stage, refinement of listings of units on the basis of the plan for social-economic development of the city, schedule of its detailed planning, instructions of those making selections, and critical observations of specialists and workers' suggestions must be carried out to determine the availability of prepared design-budgetary documentation. This is not an idle question. Currently, on the average, this takes up to 2-3 years. Deficiencies in the work of the group making the plans lead to the fact that nearly every third project is developed "on the shelf," and then is copied down on scrap paper, which evidently is not thrifty and obviously conflicts with the course of every kind of economy.

An operational engineering-economic plan of city build-up for a two-year period must be worked up taking into account architectural, economic and engineering requirements; to consider the optimum work load of contracting organizations; the joining of all bureaucratic engineering communications in association with overall municipal construction; and other problems.

In the third stage, the operational engineering-economic plan is examined, adjusted where necessary, and is approved by the highest territorial instance for construction - the territorial city designing and building council. The plan must be composed of five parts.

The analytical part of the plan contains computations of all necessary economic parameters on the basis of the level achieved in the last 3-5 years, with adjustment for new conditions and demands.

The second part is a listing of units, including their breakdown for the first and second years of construction, with specified estimated cost, design series, plan for allocating resources by quarters, time of work start and completion, designation of the client, contractor and other necessary information. After approval, this document, in essence, becomes the directive for all construction participants.

The third is the information album, in which every building and its neighboring streets must be sketched, and information on facades, the engineering system plan with junction plants and concise technical-economical indices, etc. must be shown.

The fourth part consists of explanatory notes on every aspect of the engineering systems with a schematic diagram cut-out of all units, with specified separation points and connections, specifications for construction sequences, recommendations on coordinated systems of units with systems whose development is financed from central sources (by the ministries of power and municipal economy).

The final part (fifth) contains the breakdown of participants and plan for designing residences and cultural and general buildings for the two-year period.

It must be said that, additionally, development of several variations of the plan, taking into account maximum and minimum possible amounts of allocated finances, changes in structure of output of construction industry enterprises, etc., is desired.

The question arises: who can and must develop this operational engineering-economic plan for city build-up for the two-year period? Probably, this will require creation of an engineering-economic section in the city municipal construction council. It should include the chief city architect with a group of architectural specialists, director of the design institute, fulfilling the function of a common designer, and leading specialists in planning, engineering systems and estimations, representatives of the technical service organizations (producers of technical specifications), clients, contractors, planning departments and Stroybank.

It is expedient to entrust technical development of plan documentation to a single designer. He must be a common legislator in the area of design of residences, cultural and general buildings and engineering systems. City build-up as a unit must become the basic principle.

Such a reorganization will require certain expenditures. Namely, this case always gives birth to the question: where will the additional resources come from? One need not look far for the source. It is necessary to eliminate waste of financial resources on worthless planning and put this money into a permanent planning organization. Then they will begin to give the national economy an actual useful output, and the costs will be repaid with interest.

The operational plan for city build-up must be flexible and provide, even after its authorization, the feasibility for known adjustments, depending on total conditions. We emphasize that the question is not about that "adjustment" which hides failure to achieve the goal, but that which focuses on achieving the end result.

We would like to try to clarify the above with an example. If, with traditional planning organizations, a client for some reason finds himself not in a position to finance work for future construction of a building already begun, construction is halted. With the "continuous" type of planning, there are a number of possibilities to avoid loss of time. The gorispolkom is in a position to transfer the uncompleted building to another paying client, who can provide financing and subsequently continue construction. In the following

year, the new client can repay the loan "in kind," having transferred a building to the former client with approximately an equivalent amount of uncompleted production.

It is expedient to make the same principle available to other spheres of business interrelationships of partners in construction.

With the construction system described, it is possible to provide flexibility and continuity in plan fulfillment. Adjustments, trade-offs and settlements can be made at corresponding "levels" of management departments, and the production process can go on with stability and without interruptions.

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CAPITAL EXPENDITURES FOR HOUSING, EQUIPMENT IN MEAT, MILK INDUSTRIES REVEALED

Moscow STROITEL'NAYA GAZETA in Russian 16 Oct 83 p 2

[Interview by STROITEL'NAYA GAZETA correspondent with P. A. Boldyrev, deputy minister of the USSR Meat and Dairy Industry: "Today is the Day of Food Industry Workers; A Word to the Customer"]

[Text] On the eve of the professional holiday of food industry workers, our correspondent met with the Deputy Minister of the USSR Meat and Dairy Industry P. A. Boldyrev and asked him to answer several questions.

[Question] A special place in the Food Program is given to the meat and dairy industry, which is called upon to provide the Soviet people with vital food products. What are the current tasks facing builders, installers and operational specialists in the development of this industry?

[Answer] In the current year, over 700 million rubles in capital investments have been directed toward the development of a production-technical base for the meat and dairy industry. A third of these is intended for the reconstruction and technical retooling of operational enterprises. Construction is being done on 251 facilities, with 81 of the projects currently under way. Naturally, our general task is to place them into operation on time and with high quality.

[Question] How much of the planned work has already been completed?

[Answer] In the nine months of the year, 22 percent of all planned capacities for the manufacture of dairy products have been made operational, 12 percent for the output of cheese, and 16 percent for meat processing. Twenty-five facilities have been accepted into operation, including large dairy plants in Kaluga and Orel, a slaughterhouse in Omsk, a cheese plant in the Dneprorudnyy Zaporozhye Oblast, and others. The program for operational introduction for the nine month period has been well implemented on the whole. However, we must not forget that the main part is still ahead. In connection with this, the noticeable lag in mastering the limits of construction-installation work at a number of projects under construction is alarming. For example, the Tsemstroy Trust of the USSR Minstroy [Ministry of Construction] is erecting the meat combine in the city of Atyashevo (Mordovian ASSR) at a very slow pace, while the Karachaycherkesspromstroy Trust of the USSR Minpromstroy [Ministry of Industrial Construction] is slow in erecting the meat combine in Cherkesska in Stavropol Kray.

[Question] How is the program of construction for residential housing and social-domestic facilities for workers in the sector being fulfilled?

[Answer] Our ministry allocates significant funds every year for this purpose. However, we must say honestly that they are being mastered unsatisfactorily. The task for the first two years of the five-year period is only 71 percent realized. The situation is also no better this year. Contractors have fulfilled only 52 percent of the nine month plan for residential-civil construction. This leads to unsubstantiated delay in construction times. Thus, the Uralmed'sstroy Trust of the USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises] did not provide for the operational introduction of a residential house for the meat combine in the city of Irbit in Sverdlovsk Oblast which had been planned for the second quarter, while Trust No 3 in Sochi did not submit for operation a dormitory for the local meat combine in the third quarter.

[Question] What is the ministry doing to increase the level of technical equipment of the enterprises and industrialization of construction for facilities in the meat and dairy industry?

[Answer] The scientific-research and design organizations in our sector, together with the Minlegpishchemash [Ministry of Machine Building for Light and Food Industry and Household Appliances], are constantly improving the technological equipment of enterprises. It is enough to say that thanks to such cooperation, 39 types of new technology have been created in the first two years of the 11th Five-Year Period. Over 1,300 units of new equipment will be introduced in the current year which will be outstanding in its high level of automation and will make possible the more rational utilization of raw materials.

For example, dairy production will receive modern ultrafiltration installations for processing whey into refined milk sugar. Moreover, a significant amount of modern equipment is being delivered to enterprises under construction from the CEMA member states.

The introduction of lightweight metallic structures manufactured by organizations of the USSR Minmontazhspetsstroy [Ministry of Installation and Special Construction Work] into construction practice will noticeably increase the level of industrialization in the construction of sector enterprises. These are already being used at a number of facilities.

[Question] The year 1984 is not far away. Is the preparation for the implementation of its building program proceeding successfully enough within the scope of your sector?

[Answer] At the present time, the coordination of plans for contract work with the construction ministries is being completed. All the complexes under construction in the coming year have been reviewed in detail by our ministry: their engineering provision, their supply of equipment and materials, their buyer deliveries. Orders have been placed for the manufacture of non-standard equipment at the ministry's enterprises.

In developing the plan, basic attention has been given to providing facilities under construction with capital investments and to concentrating assets on the most important construction sites in the agroindustrial complex. The necessary means have been provided for creating a sufficient stockpile of semi-finished products which will make it possible to ensure the timely operational introduction of capacities in subsequent years.

Moreover, the ministry is performing work on preparing a staff of operations specialists whom we will send to supervise installation and operational set-up organizations at the concluding stages of enterprise construction. We plan to give aid to builders and installers with trained workers from operational enterprises within the sector.

However, all these efforts by our ministry can only facilitate the normal course of construction. The main task depends on our contractors. We would hope that they work even more successfully in fulfilling all the projected plans and responsibilities.

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## INDUSTRIAL CONSTRUCTION

### TRUD ON LIGHT INDUSTRY CONSTRUCTION SHORTCOMINGS

Moscow TRUD in Russian 12 Oct 83 p 1

[Editorial: "Light Industry Construction Sites"]

[Text] In the years of the 11th Five-Year Period, capacities for the output of goods for public consumption valued in hundreds of millions of rubles are to be put into operation. Great assets are directed every year toward the development of light industry, which is primarily called upon to satisfy our needs in terms of goods which are in everyday demand. This means that the selection of goods on the consumer market greatly depends on the work of builders and on their abilities to master the assets allocated by the state and to turn them into factories and plants.

In the third year of the present five-year period, the construction of 124 light industry enterprises is planned. Many collectives are successfully approaching the set goal. Construction Administration No 32 of Trust No 8 has worked well in the first six months, constructing the Brest Carpet-Cloth Association. It fulfilled its plan for construction-installation work by 102 percent. The work administrations are presently entering the pre-operational period ahead of schedule. The builders of Trust No 8 in the "Gomel'promstroy" association are working successfully. They are preparing the Kobrin Textile-Weaving Factory for presentation to the state commission. Bashkir builders are erecting the Sterlitamak Leather Combine, which will manufacture velour clothing valued at 70.2 million rubles annually, exactly according to schedule. The "Promstroy" trust in Moldavia, the "Mosoblstroy" No 10, the "Glavsevkavstroy" Trust No 5, and many others are calmly and assuredly bringing their construction projects to completion.

However, despite the achievements of leading construction collectives, the plan for capital investments in the development of light industry on the whole is not being implemented. The semi-annual assignment for construction of sites in light industry is only 93 percent fulfilled. In individual ministries this indicator is even lower, as for example in the USSR Mintyazhstroy [Ministry of Heavy Industry] and in the USSR Minstroy [Ministry of Construction]. Even now at many of the most important facilities in light industry which are listed as being introduced into operation, work is far from completed. Some of them are clearly in danger of work stoppage.

This situation has developed primarily because the ministries do not give sufficient attention to construction sites in light industry. Certain group "B" projects under construction are not provided with sufficient work force and technology, conditions have not been created for high labor productivity, and there is often a shortage of building materials and structures at these sites.

For example, the "Tselinogradtyazhstroy" Trust of the USSR Mintyazhstroy began erecting the Tselinograd Spinning Thread Factory back in 1977. Since that time, only half of the assets provided in the estimate have been realized, and the end of construction is not in sight. However, the initial operational introduction of this important facility is set for the end of 1983! Equipment valued at over five million rubles has even been brought here. Why is it that the work pace remains the same as it was a year and two years ago? There is a constant manpower shortage at the construction site, the site is not provided with enough prefabricated reinforced concrete and other materials, and the quality of construction is low due to poor quality control. Why is it that the alarm is not sounded at the USSR Mintyazhstroy in the face of clear danger of task non-fulfillment? Could it be because the factory comprises only an insignificant portion in the volume of the ministry's contracting work? Nevertheless, we must not forget that it must provide the consumer market with a product which is in short supply and which is presently bought partially from other countries.

The miscalculations and shortcomings in the construction of this facility are characteristic to one degree or another also for certain other construction sites. Among these are the Chernogorsk Synthetic Leather Combine, the Zheleznogorsk Sewing Factory, the cotton spinning factory in Sachkhera, the Tashkent Textile Combine currently under reconstruction, the Kuntsevskiy Chrome Leather Plant, and other facilities under construction in light industry.

The client ministries and the contracting construction organizations must, without losing one more day, bring order to the facilities submitted for operation. They must define the complexes under construction and provide them with documentation, materials and equipment, and manpower. It is very important to coordinate the efforts of numerous organizations taking part in construction in terms of work time and sequence.

Here the professional union organizations can and must say their word. They have at their disposal such a tested and effective means as the competition of related sectors according to the principle of the "Work Competition." An example of the organization of such competition may be the construction of the third line of the Donetsk Cotton Combine, where the general contractor is the "Glavsevkavstroy" Trust No 5 Collective.

One of the most serious shortcomings of capital construction remains the dispersal of effort and means. The construction sites of light industry have also not freed themselves from this. Recently a TRUD correspondent showed what the race for gross indicators leads to using the example of the synthetic detergent production which was under construction in Novomoskovsk. At the same time, there is a reliable means against this "misfortune" -- a work crew contract aimed not at gross indicators, but at the end result, i.e., the completed facility.



The professional union committees together with the economic managers must be more persistent in introducing the work crew contract, as is done, for example, in Lithuania at the Panevezhskiy Trust, which successfully built the first line of the linen factory and other facilities. Efforts must also be made to see that the existing cost accounting brigades have everything necessary for completion of the work contracted.

An object of particular attention by the professional union organizations and economic managers must be the work discipline at the construction sites. The concept of discipline must include not only the timely start and completion of the work day, but also the intensity and effectiveness of labor, the quality of construction, and the adherence to economical technology and conditions.

Practical experience has shown that all these numerous problems in the organization of construction are solved better and quicker in places where professional union site headquarters are created for the period of construction, which take on the responsibility of coordinating the activity of tens of collectives -- from installation to transport and plant collectives.

The task of saturating the consumer market with goods and of meeting the demands of the population was given primary importance at the November (1982) Plenum of the CPSU Central Committee, and builders must make their contribution to its implementation already this year.

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## AGRICULTURAL CONSTRUCTION

### SELECTED ARTICLES ON RURAL CONSTRUCTION

#### Simple Huts, Russian Stoves Praised

Moscow SOVETSKAYA ROSSIYA in Russian 1 Apr 83 p 3

[Article by Pavel Krupenikov: "Order for a Hut: Why Certain Contemporary Housing Plans Are Not Suitable for the Rural Inhabitant"]

[Text/ SOVETSKAYA ROSSIYA has already conducted a detailed conversation about what the contemporary village should be like. Party and Soviet officials, planners, architects, and village inhabitants all expressed their own opinions. Letters from readers testify to the fact that this topic remains a pressing one. Today it is continued below by the writer P. Krupenikov.

There exists what I would call a coquettish word--"cottage." It is beginning to appear more and more often in circulation. What does it mean according to the dictionary? A single-family urban or rural house with a plot of land, a traditional type of British dwelling, which has become widespread in European countries and the United States and which usually has two storeys. And it seems that the great Russian language lacked sufficient words for designating its own dwellings; it lacked them, and that's all there was to it! The word "cottage"--designating no more or less than the typical British type of house --was needed.

There is nothing to be done about it if one does not like the word "izba," as something too understandable, prosaic, and unfashionable.

I'm not going to conceal the fact that cottages are not to my heart's liking. And this is not just because of their foreign origin. Just take a look at the bright, attractive catalogues of individual residential buildings. The first thing that strikes your eye is the large number of plans and, at the same time, the limited choice of what is necessary and suitable for village life. And the second thing is the intentionally very high prices. The All-Union Revue-Competition for the best structures and the best-laid-out rural populated points in 1981 demonstrated that the architects, to put it mildly, made no great attempts to reduce the outlays of labor and materials.

According to these plans, one square meter of usable space costs the builder from 251 to 485 rubles, while a square meter of total area is in the range of 200 rubles. Only the Central Scientific-Research Institute of Experimental

Planning in its splendidly executed catalog entitled "Vash dom" /Your House/ (Moscow, Rossiiskhizdat, 1980) has dared to present a somewhat more modest dwelling--a single-storey, single-family, three-room, brick house with stove-type heating, but without amenities; for such a house one square meter of usable space costs 153 rubles.

There are several causes of the high price for individual structures. One of them is the expensive diversity of materials. Just to enumerate them will take quite a bit of space: hollow bricks, air-entrained-silicate, lightweight-concrete blocks, frame-type, gypsum-concrete partitions, plywood panels, keramzit-concrete small-size slabs, ceramic, seven-slotted stones, structural roofing panels.... Stop! Dear comrades, where, in what store, would a builder be able to obtain such material, which is in short supply?

There's a cottage for you!

But let us turn our attention to the "izba" [hut], about which the dictionaries state simply: a Russian log-type dwelling. By the way, it is not at all mandatory that it be a single storey; it has also been built on two or even three levels. What are the advantages of a hut? A minimum set of materials. From the foundation to the roof it can be made of wood. Let us recall the local timber materials: beams, boards with grooves for the roof, pine or ash lathing, as well as staves such as those which were used to cover the cupolas in Kizhi, etc. There is no particular complexity involved in setting up their production.

A second cause of the very high prices of contemporary individual houses is the complexity of their construction, an unjustifiable piling up of all manner of details. Double-pitched roofs do not suit these planners. Little balconies, overhangs, roofs with extensions, various types of projections beyond the bounds of the box-type form--all this is simply being pretentious at the drawing board, a striving not for beauty but for prettiness. No, I am not for over-simplification. Primitivism is not the issue here. What we need is a golden mean.

In cottages the same kinds of windows will not do; they are "not contemporary." Everyone has his own custom. The windows are varied both with respect to size and location along the horizontal, which, naturally, makes it more difficult to put a concept into practice. And in the North the builders are more concerned with something else. The traditional size of the windows in a Russian hut permits the necessary minimum of light which can be received during the short winter days and the maximum retention of the heat which is so valuable here.

With a hut everything seems more simple. Instead of a foundation the owner hurls up or rolls up 6--8 large boulders, places a log foundation on them, and then erects his mansion level by level. A simple, box-like form without pretentious floridity and extravagance, a double-pitched roof, as well as a building addition.



Such barnyard structures must be discussed in particular detail. In the case of the cottages they have either not been provided for at all, or the barnyard has been situated at least a hundred meters distant. During a cold, hard frost, rain, snow, wind, or in the dark the housewife, in order to check up on or feed the animals, must get dressed as if going on a long journey and go out onto the street. In the northern villages from time immemorial the livestock was kept under the common roof. Located in the building annex were the hayloft and the woodpile; the tools were also stored here--everything close at hand. The barnyard area was completely and cleverly isolated from the living quarters by hay, storage areas, and other cold areas, which ensured the necessary cleanliness in the rooms. In order to store products for the future there was space in the cellar, attic, and loft.

Now it is asserted that the residential section and the barnyard are incommensurable; such an arrangement of block units, they say, contradicts the sanitary norms. Does that mean that a garage with its gasoline fumes right under the kitchen window can be built, while a barnyard, isolated from the hut, cannot be built? But, of course, rules of prohibition have been formulated by people, and people have not been insured against making errors. If rules bring about inconveniences instead of creating benefits, they should be changed. Beauty does not lie in something artificial, thought-up, borrowed, or superficial; it lies in simplicity. The Russian hut meets many contemporary requirements; we should proceed from this, take and develop what is good and reject what has become obsolete. Let me remind you that the peasant also knew how to decorate his own dwelling: wood carving, for example. Architects have scorned the traditional art of the village builders. At the same time, the building regulations for the rural populated points of the RSFSR state directly: "In order to enhance architectural expressiveness in the construction of residential dwellings and barnyard buildings, it is necessary to utilize national and local traditions, the experience of folk architecture."

But what do the rural inhabitants think about huts and cottages?

"In life matters happen as follows:" states the architect A. N. Mal'ginov, "a builder arrives; you show him some plans, you explain what, how, and why. And then you hand him a plan, amplified and adjusted for the local conditions, without colors, without offset--on tracing paper. And the builder will most frequently take this as the basis for his structure. It is evident that no small role is played here by the fact that this plan does not take away from the future homeowner his creative function as a builder. The peasant himself has always been architect, customer, contractor, and the state commission. And one must admit that he has coped quite well with his obligations. To this very day we take delight in the external appearance of many houses, the suitable arrangement of the out-buildings, and the overall planning of the land plot."

And so, amid the "sea" of plans, the simple hut is chosen, moreover, the most widely employed size--6 meters by 9 meters: three rooms, a kitchen, an attic, a flight of steps, a veranda, stove-type heating, then a log-type attachment and a detached garage.

I asked: just how much would it cost to build such a "complex"?

Mal'ginov made some calculations, but the figures were not on paper; the figures were in his head:

"The house itself would be 7,000 rubles. A new, beam-type shed 4 by 6 meters in size costs 1300 rubles. A log-type bathhouse 2.5 by 4 meters in size would be another 600 rubles. A frame-type garage, covered with roofing iron, would cost 450 rubles. And so the whole set of buildings would come to 9,350 rubles."

As compared with cottages, this is half or even a third as expensive.

\* \* \*

Most of the plans thoroughly reject a very important element of a northern Russian dwelling--the stove. Let's look at the arguments "against" and "for" it.

Right away, they say, where is one to get bricks? There was a time when the consumer cooperative would sell them to the population, but this has now become a rarity. One could, of course, make a stove out of structural bricks, but they are not designed for high temperatures, and after a not-too-lengthy period of use they burn out and lose the necessary properties.

Are there possibilities for producing bricks in the localities? Yes, there are. Non-chernozem soils do not produce good clays. In earlier times, the old folks tell us, here and there one would encounter handicraft types of kilns. Now this ancient craft has virtually been forgotten. It is not suitable, you see, to descend to such a primitive form of labor organization. All right, let's turn to industrial methods. The process of producing bricks is more amenable to mechanization and even to automation than, let's allow, the making of ceramic beakers, vases, or ash trays with figurines. However, their production was successfully set up at a local plant making drainage pipes. From the "first peg" this factory has been headed up by an energetic person, the capable manager Georgiy Andreyevich Mavromadis. His opinion is as follows:

"In principle, it would be possible to set up the manufacture of stove-type bricks; however, no one has ever raised such a question."

On the other hand, heat-refractory bricks are still necessary in repairing stoves in old huts.

There is also the following obstacle: difficulties in procuring fuel. One must purchase a wood-cutting ticket, indicating what kind of trees will be felled and where the plot of land is, how the logs will be rolled, cut up, and hauled from the forest. One needs to secure the services of a person with a Drazhla power-saw, request a tractor operator, because you will hardly be able to find a horse. And, naturally, this necessitates some

well-known types of "pocket" payments. Such a procurement of firewood, let's say, among retired persons on pensions disrupts their budgets. Moreover, sovkhoses and other enterprises have only minimum plans for such everyday services, and even these are not carried out regularly.

If one speaks about other heating devices replacing or duplicating the Russian stove, e.g., about gas or electric ranges or separate boilers, then, you know, here too the situation with regard to fuel resources is not without its problems. Should we refuse to have anything to do with the Russian stove and firewood in the future? There are still quite a few of them in this country.

And, in conclusion, a few more words about the merits of the Russian stove. Gas or electric ranges can boil, roast, and bake; a separate boiler can heat up and provide hot water. A Russian stove satisfies any and all cooking requirements, it heats the dwelling, and with a slight adjustment can also supply water for bathing and laundry needs. Soup, meat pies, etc. are cooked much better on a Russian stove than in any other way.... It imparts to them a special taste, aroma, splendid qualities, and even a kind of languor.

Celebrated in many legends, the stove, moreover, also has the capacity for treating radikulitis, the common cold, and those diseases which require a dry heat.

Of course, it is not a simple matter to construct a good stove: it is necessary that it not smoke, that it not burn too hot or consume too much firewood, nor give off charcoal fumes. In former times skilled craftsmen used to travel around from village to village; they were able to make stoves without bricks, using clay alone. And they were called stove-makers.

Can the present-day ranges, gas pumps, and systems offer such a wide circle of services? The regulations for building up the republic's rural populated points prescribe the following: "The heat supply of farmsteads in the first phase should be carried out from local heat generators." With respect to simplicity, unpretentiousness, variety of functions, economic qualities, and an ensured supply of fuel for the future, the best "generator" was, is, and will be the Russian stove.

The expensive penchants of architects and planners for foreign mannerisms, as well as the neglect of national and local traditions, in no way facilitate the development of individual homebuilding. And, you know, a private home is far from being just a private matter. Moving in under one's own new roof comprises a contribution to the solution of the housing problem in the country, as well as a reliable promise to one's own native village and one's native land to live and work on it for many long years.

#### Farmstead House Design Discussed

Moscow STRU:TEL'NAYA GAZETA in Russian 8 Jun 83 p 3

/Article: "What Should A Farmstead House Be Like"/

/Text/ The vitality and force of words are truly amazing. A sense of irreparateness wafted from the concept of the "futureless village," which, at one time, was launched into general circulation. This verbal tag was turned into

material homes--the roots of being were undermined in such villages; all efforts were put into building up the central farmsteads. At the expense of the farms, of course.

Thus, the villager, originally the owner of his own home, became a kind of migrant, an "apartment-house dweller," while the balance sheets of kolkhozes and sovkhoses had to bear the heavy burdens of newer and newer square meters of the housing stock. It became fit for the ZhEK [Housing Operation Office] to open up an urban style! The scope of this process may be judged merely by considering the farms of Moscow Oblast: the volume of individual housing construction on these farms, according to data for the 10th Five-Year Plan, as compared with the 7th Five-Year Plan, was reduced by 9/10, and it comprised only 4 percent of the area introduced in the rural area.

The rebirth of the farmstead in a new capacity has now begun already, although it is proceeding too slowly yet for the country as a whole. The state plan for individual and cooperative construction in the rural areas has gained momentum, and experience has been accumulated. A sharp, fundamental turn has been made likewise in the transformation of villages in the area around Moscow. At the recently held plenum of the CPSU Obkom and the session of the Oblast Soviet the following task was set: by 1966 to come up to the level of the annual construction of farmstead-type houses amounting to 400,000 square meters of housing space; this will comprise 80 percent of all housing introduced in the villages around Moscow.

The participants in the editorial press club talked about the practice of farmstead-type construction. Their experience, opinions, and remarks are of undoubted interest to a wide circle of readers. Therefore,

We now turn the floor over

to a farm director,

**N. Nikulin:** During the last few years we have managed to build up the central farmstead in a comprehensive way. We have erected housing and socio-cultural facilities; the level of comfort here has approached that of the urban areas. Thereby we have succeeded in retaining a certain portion of people who had wished to move into the city. And then we have considered it necessary to improve the conditions for specialists, for those working in the leading occupations--such as, for example, that of milkmaid. They understood, of course, that a cottage, under all conditions, would be more expensive per unit of space than a sectional house. In 1960 we began building a small settlement within an existing village, and we connected it organically with the central farmstead area. We erected thirty houses with all the communal conveniences. The people were very well satisfied.

**Question:** What about the cost?

**N. Nikulin:** Well, let's say, a three-room house with a living space of

48 square meters costs 17,500 rubles. That is without a network of utilities. In accordance with the accepted procedure, a rank-and-file worker contributes 10 percent of the initial cost, while engineers and technicians pay 20 percent. The cost of the house itself is divided by halves --8,750 per half. Upon moving in, the worker pays down 1,750 rubles and then pays off the remaining 7,000 without interest in installments over a 20-year period in accordance with the terms of a Gostbank loan. We amortize the other half of the cost by means of the material-incentives fund. We impose one stipulation: the person must work on the farm for 20 years; then the house passes completely into his personal ownership. If the person leaves for any reason, then he either must release the house or pay its full value without the aid of the sovkhos.

Question: Has this solved the personnel problem?

S. Nikulin: Yes, we have almost no turnover.

To the builders:

G. Orlov: Farmstead-type housing constitutes 15 percent of our Orelsel'stroy Trust's program. We are erecting more than 200 houses made of brick in 18 settlements. Panel-type houses are not suitable in our area: they are expensive, too cold, and even their architectural concepts are not so good. Moreover, strange as it may seem, labor outlays on them are too great. The average cost of a cottage is 21,000 rubles, and with utility and communications hook-ups it is 32,000. It is, of course, an expensive matter. Therefore, we consider that the central farmstead should be built up of sectional-type buildings with the basic facilities for social and cultural everyday services. It is right here, on the existing network of lines, that the farmstead housing should be built up. Then it would be significantly less expensive. It is high time that we solved the problem of farm buildings for the sectional houses. At present in our oblast it is permitted to make a shed with a size of 4.4 square meters. This is very small. But in workers' settlements and rayon centers it is impossible to put up even one of that size. A more flexible solution should be adopted: you know, we are depriving the population of the rayon centers and the inhabitants of the sectional houses of the possibilities of conducting subsidiary farming!

V. Artaruni: The Glavmosstroy Association has built up the settlement of Meshcherskoye in Ryazan Oblast with three-storey, sectional houses. They have erected a club, a school, a kindergarten, and a shopping center. I do not agree with Comrade Orlov that panel-type construction is less attractive than brick construction. With respect to architecture, it can be even better, and with respect to labor expenditures there is no comparison. The whole trick here is to have good pre-planning, technology, and operational organization. The real problem is something else: what to build from the panels? Our houses in Meshcherskoye have all the comforts. But, evidently, the very type of urban, apartment-type housing is not too attractive for a rural person. Old huts stand alongside the settlement, but no significant trend of mass resettlement from them has been observed.



To the planners:

N. Dykhnovichnaya: Now the goal has been precisely formulated--to utilize up to 15 percent of the capacities of the home-building base of the cities for building up the villages. The TsNIIEP [Central Scientific-Research and Planning Institute for Standardized and Experimental Planning] of Housing has proceeded to develop plans for farmstead-type houses, based on the 121, 90, 84, 83, and 464D Series. So far we have succeeded in utilizing 70 percent of the parts from the products list of the urban enterprises. But, in general, the task of creating an economical and comfortable, industrially produced, farmstead-type house is not so simple as it might have seemed at first glance....

Yu. Kirsanov: Farmstead-type houses have turned out to be very expensive. Their cost amounts to as much as 50,000 rubles. Strictly speaking, it is not the house itself which is so expensive but the accompanying facilities--the utility networks and the roads. Every square meter of road costs 18 rubles--that's for one and a half tons of freight. And if the farmstead is located somewhere in a remote area, how much will it cost then?

To a representative of the RSFSR Ministry of Rural Construction:

A. Bugomaz: Last year the organizations of our ministry introduced 340,000 square meters of farmstead-type housing, while in 1985 they are confronted with the task of introducing 800,000. This problem must be solved, above all, by industrial methods. But, in my opinion, we are utterly not prepared for this! In order to produce farmstead-type houses instead of the present-day series, it is necessary to add 40 percent more metal fittings. On the scale of our ministry alone, many hundreds of tons of metal. Officials of the TsNIIEP of Housing, the Design Bureau for Reinforced Concrete of RSFSR Gosstroy and the TsNIIEP of Civil Rural Construction must during the briefest possible time periods work out such plans that farmsteads may be built out of the structural components of the sectional houses with the minimum outlays. The task is a dual one--we are speaking about the creation of new KPD [Large-Panel Home-Building] enterprises with a flexible technology as well as about re-equipping the existing ones.

To a representative of the Moscow Oblast Ispolkom:

P. Rubarskiy: Building up farmsteads has been conducted in the area around Moscow for many years. More than 80 cooperatives and villages have been created in this oblast, based on individual construction. Now this work has begun to be expanded. By 1986 the annual erection of 4,000 farmstead-type houses is planned. We are offering builders 26--28 building variants, in short, something to suit every taste. Their costs vary from 17,000 to 23,500 rubles (without utility networks). Of course, that is somewhat expensive. The conversion to farmstead-type building entails a doubling of the price per square meter of area, as compared with the sectional-type buildings. But the state is making progress on this, granting privileges and, furthermore, selling houses at wholesale prices.

To a representative of the Roskolkhozstroy Association:

Yu. Komissarov: We have adopted a course aimed at developing industrial-type home-building in the rural areas. The network of SSK's [Rural Building Combines] has been expanded. At present there are 54 of them, while by the end of the five-year plan there will be something on the order of 70. We will bring about a situation whereby every oblast will have one or two such combines. Now about labor outlays. As of today, they are distributed in the following manner: in plants--30 percent, and at construction sites--70 percent. We must turn this pyramid upside down; 70 percent of the labor outlays ought to be transferred to plant conditions. Hence also those tasks which are being confronted in developing industrial-type home-building. And not only the panel-type houses. We should also use complete plant manufacture for volume-block houses as well as buildings made of artolit and of vitro-brick panels.

To a representative of Gosgrazhdanstroy:

V. Kudeykin: People have made mention here of aid from the city to the rural area. And they spoke correctly; such aid must be rendered. But recently I visited Tambov Oblast, and there the picture is as follows: in Michurinsk the ROFSSR Ministry of Rural Construction trust is carrying out 40 percent and in the city 60 percent of the entire volume of work. A strange situation has developed: we request aid, but we use the capacities of the rural contractor in the cities....

Necessary commentary

As we have seen, the transition to mass, farmstead-type building has turned out to be an extremely difficult matter. And, above all, we are stunned by the cost of the cottages; the price simply rises up and bites you! It is fine if the farm helps, or if there is a ZhSK [Housing Construction Cooperative]. But what about the individual builder, to whom the bank, as a rule, will not loan more than 3,000 rubles?

It would seem that it is precisely the urban home-building enterprises with their high standards of production which should provide the rural areas with the least expensive housing. But it turns out to be just the opposite: their "meter" is 2--2.5 times more expensive than the average indicator set by USSR Gosplan. Thus, the official cost of a farmstead made of parts from mass series in urban use amounts, according to the preliminary estimates of the TsNIIEP of Housing, to 15--16,000 rubles. But let's not delude ourselves--the real outlays are double or even triple the official cost set forth by the planners. To be sure, the Gosstroy of the Union republics have set up norms for the cost limits of area in individual houses. Of course, in this matter we must conduct a thoroughly profound analysis of the extensive, and even too extensive, planning fund which have been created by the country's institutes over the course of many years; and a meticulous selection of the most successful solutions must be made.

In Latvia, for example, it was recommended that farmsteads be built with walls made of gas-entrained blocks, a square meter of total area of which costs no more than 165 rubles. In Kirghizia, among the plans proposed for the rural areas, on an average the cost of this varies within a range of 200 rubles. In Dnepropetrovsk Oblast it is approximately 170 rubles, and, obviously, here, therefore, two-thirds of the rural housing is erected using the funds of the

working people themselves. This experience is worthy of attention, for at relatively low prices the maximum use should be made of bricks, wood, and other local building materials.

But as regards the industrial-type of rural house made of reinforced-concrete structural components, its prestige, as it turns out, is low not merely because of its price. Such a house is cold--this was mentioned with annoyance and alarm by practically all those who spoke at the press-club session.

Cold? Yes, cold!

"When we computed the optimum amount of fuel for a three-room farmstead, created on the basis of Urban Series 90," said N. Lykhovichnaya, "we simply could not believe the figure--10 tons of coal! The heat losses are enormous and are due, for the most part, to the fact that the exterior walls, made of keramzit concrete, practically everywhere have a volumetric weight higher than that of the design."

And, indeed, during the heating season farmstead owners expend 12--15, or even 20 tons of coal. A panel-type house of the Series 135 requires approximately 30 cubic meters of firewood, and if electric power is utilized for heating purposes, this amounts to 42,000 kW-hours.

"Just imagine the owner of such a house," Yu. Kirsanov stated more specifically. "To purchase coal, one needs to provide for 150--240 rubles in the family budget. But it is terrifying even to speak about the electric meter: at present-day estimates it would wind up 2,000 rubles! And why all this? The house is certainly cold. It gets cold within two or three hours if not heated constantly. But if you look at the standardized plans, everything seems to be within the appropriate norms, and the hygienic conditions have been ensured!..."

"We are really not heating the houses but rather the streets," added P. Afanas'yev in support. "For every square meter there is an over-expenditure of heat which exceeds the norm by a factor of 1.5. With a panel thickness of 350 mm and a volumetric mass of the keramzit concrete of not more than 850 kg/m<sup>3</sup>, as provided for in the SNiP [Construction Norms and Regulations], the heating characteristics would be observed. But, having traveled about half the country, I can state with authority that almost everywhere panels are being used with a mass of 1100--1300 kg/m<sup>3</sup>. If the rooms are not heated to excess, then a house with such walls will have no more than 12--14 degrees of heat during a 30-degree frost. Our production workers for some reason consider it possible to utilize not keramzit sand but quartz-type sand, which is, naturally, heavier."

...Strictly speaking, the specialists noted that the same kinds of panels are being installed in the rural areas as in the cities. But in the urban, multi-storeyed apartment houses, where only one wall of each apartment faces onto the street, a level of comfort is easier to provide. In the corner apartments it is somewhat more difficult: the inhabitants request additional radiators and utilize electric heaters. And it is not at all a simple matter to ensure hygienic conditions in a panel-type farmstead, when all four walls are letting heat escape, and, moreover, it is also getting out through the floor and the

roof. A great deal of fuel must be expended for every square meter of housing space. This is simply intolerable! All the more so in that what we are talking about now is not just individual houses but mass construction.

"We do not need such panel-type houses," stated I. Shadrukhin. "No kind of fuel would be enough; we would simply burn it all for heating purposes! By the way, even in the cities the fuel savings which we have achieved by converting from individual, small boilers to a central-heating supply have been "eaten up" by cold walls. It has been correctly said here that we are heating the street. And all this is occurring when an era of expensive fuel has come upon us! Is it really possible that our engineering thought has become so impoverished that it cannot solve such a simple problem? It must be solved and as soon as possible--we are obligated to do this by the decisions of the party and the government with regard to economizing on resources.

"We must improve the heating of the industrially produced rural house rather than abandoning it!" noted V. Kudeykin.

...It is impossible, the press-club members remarked, to proceed along the path of simply increasing the thickness of the panels. This requires a replacement of the fittings, along with an increase in the expenditure of raw materials and the building weight. We should make the transition to triple-layer panels, insulating them with foam polystyrol, a foam blanket, or foam polyurethane--where this is available.

"I, for example, have never heard of anybody setting up even an experimental production of panels with insulation for rural houses," said P. Afanas'yev in connection with this.

"The RSFSR Ministry of Rural Construction has in the Northern Caucasus five plants for turning out perlite," noted A. Bogomaz. "On this basis we are beginning to introduce triple-layer panels. There are also capacities for the production of foam polystyrol, but there is no raw material, and the plants have not been charged with this. In practically the greater part of the RSFSR we really have at our disposal only keramzit with its high volumetric weight."

"Farmstead-type houses," N. Dykhovichnaya continued the conversation, "require hundreds of thousands of cubic meters of insulation. Obviously, the Ministry of the Chemical Industry will have to create new capacities for producing it. In the TsNIIIEP for Housing calculations have been made on variants for heating the three-room cottages of the Series 90. They have shown that the triple-layer panels will allow us to cut heat outlay almost in half and double the heat resistance of the walls. Moreover, we have still continued to provide heat insulation for the attic, floor, and foundation, while triple-glazing has been provided for the windows. Taken together, all this makes a farmstead about 10 percent more expensive. To be sure, yet another problem has arisen--home-builders must re-structure the engineering lines to produce keramzit-concrete panels with insulation. It is difficult to solve this problem, but the ministries and departments involved will, I think, have to move toward such a re-structuring."



"We must look further to see what kind of resources we have for heaters," said I. Shadraknin in expressing his point of view. "For the time being we must build panel-type farmsteads insofar as there are materials for producing effective wall structural components."

"I would like to remind those present," said I. Dreyshev, "that provision has been made for creating 24 plants to produce heaters. At present only three are being financed...."

#### Necessary commentary

The alarm over the inevitable and substantial excessive expenditure of fuel-and-energy resources in the development of mass farmstead building in the present-day performance, an alarm which has been sounded in a number of newspaper publications, was also shared by the press-club participants. After all, the houses now being erected will have to stand for not just a year or two but for decades, and all that time they will have to be heated in accordance with the most "voracious" norms!

The problem is a serious one, but technically it is fully soluble. It was successfully coped with, for example, by the home-builders of Moscow DSK-1, when they had to organize the output of multi-layered "thermal" panels for the build-up of Tynda. It will be more difficult, perhaps, to solve the problems of organizing and planning the coordinated efforts of many ministries and departments, scientific and planning institutes, as well as enterprises, directing them at the creation of economical, industrial-type farmstead houses.

Obviously, one cannot get by without a heater. But it is also impossible to wink at those liberties which enterprises and plants have allowed themselves in making keramzit unsuitable for urban as well as rural home-building. To tighten up controls over its production is an urgent requirement of the day!

But even if we succeed in making a warm, village cottage, we have still not exhausted all the problems. The systems of its heating supply and equipment contain significant reserves for economizing on resources, labor resources among them.

#### Diversity among systems

How and by what should farmsteads be heated? Many guests of the editorial press club expressed themselves on this question.

S. Nikulin: If each house were to have an autonomous heating system, then we would be tying people to their boilers. And they would always be on our minds. Who would be left free to work in the fields? As much as possible, we must convert Moscow Oblast to gas and create modest-sized boilers servicing a group of houses.

G. Orlov: It is understood that gas is not available everywhere. In our area coal is basic. But just try to throw 8--12 tons of fuel into your own boiler during a season! Therefore, we consider that, even under our conditions, it is necessary to construct centralized boilers and heating ducts--



even though they are more expensive. Perhaps it would be worthwhile to give some thought to heating with electricity at a reduced price. Nor would our construction organs be opposed to precisely determining how best to build up settlements, taking engineering improvements into account....

Yu. Kirsanov: Of course, gas is the ideal case. But in Kostroma Oblast only 5--7 percent of the territory has been gasified. Out of 5,000 settlements, we must rebuild 3,000. And, you know, a settlement with a farmstead having 170 inhabitants requires an area of 17--22 hectares; 300 and 500 persons would require 24--40 and 44--64 hectares respectively. The length of the engineering networks per inhabitant amounts to 20 meters. Construction of boiler units, laying down communications and utility lines, plus the operating expenditures cost a great deal. And all this increases the housing costs even more...!

Yu. Komissarov: It is indisputable that the central farmstead, the social center, and the adjoining housing should be heated by a common boiler unit. But, of course, building will also proceed in the remote areas! How rational is it to use centralized systems there? What should the service zone be? Obviously, along with this we need an autonomous rural boiler unit which would meet the following requirements: it would be a heating unit, with a lengthy combustion cycle, and it could be used for hot-water heating as well as feed preparation. Such a universal type of boiler unit should be created as soon as possible.

A. Bogomaz: We need a universal, economical boiler unit such that, having provided heat for an hour or two, the house would remain warm for a long time. We still do not have such equipment....

I. Shadrunkin: Any system of heating must be economical. We cannot permit any squandering! We need an individual approach to the choice of fuel in each specific case. Where there is coal, where there is firewood, and there, where possible, we permit sovkhozes and kolkhozes to expend gas for industrial needs and heating. Now about the use of electric power in the rural areas. Over the period of the last 10 years the cost of a kilowatt of station capacity has doubled. And the efficiency of the electric-power stations is at a maximum level of 38--40 percent. That's too expensive! In places where there is no nighttime consumption it is permitted to use electric power for heating but only under condition that it is stored up at night with the aid of heat accumulators--either tanks filled with water or ceramic heaters.

P. Kutarskiy: In the area around Moscow we need AOCV-20 gas-type boiler units, but how can we acquire complete sets of equipment if they are shipped only to the retail trade network? Perhaps this question could be answered by the Gosstat representative.

A. Sak: Indeed, these boiler units are turned out in accordance with the plans for the production of consumer goods, and they are received only by the trade network. Such apparatus, naturally, does not proceed through the Gosstat organizations. Obviously, USSR Gosplan should provide for the output of this product within the national economic plan as well, and then we would distribute it.

1. Dreyshnev: We are making automated, transportable, completely plant-manufactured boiler units with capacities of as much as 5 Gcal. per hour. We have mastered the output of comprehensive systems of apartment heating. But we have been unable to develop production--there are no resources. The same situation also pertains with regard to automated boiler units for small boilers operating on all types of fuel. So far the main problem has not been solved: there is no boiler-auxiliary equipment; nobody is making it for small-scale heat engineering. At the present time structural components are being developed for the transportable boiler-unit and apartment-type heating systems in a set with solar-powered units; their use will allow us to save as much as one-third on fuel. Two or three sunny days are required to provide hot water for an entire week when the heating system is switched off. This is a realistic variant. The cost of such an installation for a boiler unit is 15,000--20,000 rubles; for an individual house it is approximately 1,000 rubles. Preparations are underway to produce small heating boiler units with extended-action combustion chambers, but 1.5 times more metal is required for them.

1. Sverilov: The country has approximately 300,000 settlements. Among them are 25,000 with centralized farmsteads. Our technical-economic calculations indicate that for those settlements having social centers it is undoubtedly feasible to plan a centralized heating system and a ductless-type laying of networks. Moreover, the density should be 30--40 persons per hectare. In places where the building up is being conducted selectively use ought to be made of automatic systems not merely of heat supply but also of sewerage.

Today it is impossible to plan rural, centralized boiler units without mechanization of the fuel-delivery and ash-removal systems. Otherwise, there would be nobody to service them. Moreover, their construction is labor consuming. In order to more rapidly solve the problem of heat supply in rural areas, we need to make 2,000--2,500 boiler units per year, and this should be done on the basis of the complete-set-block method. But for this we need steel boilers. Cast-iron ones cannot be used here, but it is precisely these which industry is turning out. This year the institute is preparing standardized plans for such boiler units. Glavsaitekhprom is aiding us in manufacturing steel boilers, but its possibilities are limited. USSR Gosplan and other departments should assist with resources and complete sets of equipment.

Now about the autonomous units. They have been studied by the Ministry of the Gas Industry. Unfortunately, such study has not been satisfactory. Moreover, they basically make apparatus which operates on liquid or gas types of fuel. But our area uses 90 percent solid fuel, ranging from hard coal to firewood. It was correctly stated here that we need to create small boilers which would ensure the carrying out of the following two functions: heating and providing a supply of hot water. A series of such apparatuses has been created. They operate on Kansk-Achinsk high-ash-content soft coal and have given a good account of themselves on rice-growing sovkhozes. Other types of units are needed for other types of coal. But it is clear that under any conditions the combustion unit must be able to remain burning for 6--8 hours or even longer--for 12--14 hours. We would like to ensure such operating conditions even when using firewood. The Ministry of Chemical and Petroleum Machine Building and other departments have begun to make similar units; by 1985 they plan to introduce the production of units with a

chamber for the long-term combustion of as many as 50,000 pieces.

And one last point. Now rural inhabitants who have a centralized heating system are compelled to put in additional boilers and stoves. The systems operate poorly and have gotten out of hand. Until such time as we organize rayon operational service, the expenditures on engineering apparatus will go sky-high.

G. Orlov: All systems and automatic units get out of order within a year or two because of unskilled service. We attempted to negotiate with the RSFSR Ministry of Housing and Municipal Services about operations. They imposed the following condition on us: set limits....!

V. Kudaykin: Questions of servicing the systems of engineering support must be the concern of the client--the USSR Ministry of Agriculture.

#### Necessary commentary

The opinion of those participating in the press-club session was essentially unanimous: for a build-up including a large group of houses, as well as in a zone of sovkhos and kolkhoz farmsteads, it is preferable to create centralized systems of heating and other engineering support. But in all cases it is important that the full set of equipment be provided with the necessary characteristics so that there exists the possibility for choosing such apparatus as would satisfy the conditions of the build-up.

As was made clear at the session (to the surprise of those present!), many types of equipment which have long been anticipated in the rural area are being made, or could be made, in sufficient quantity if the appropriate resources were allocated to the enterprises concerned. More attention must be accorded to developing and increasing the effectiveness of the small heat-engineering systems which provide 67 percent of all the heat produced in the country.

And yet another summary. The possibility of bringing about a 30-percent saving on fuel with the help of solar-powered systems is too significant a reserve to be included among the merely potential. Foreign experience, as well as our own, already allows us to decisively emerge from the hibernation of experiments and to set forth on the road of widespread practical experience!

#### More on Farmstead Design

Moscow STROITEL'NAYA GAZETA in Russian 7 Sep 83 p 2

[Article: "What Should A Farmstead House Be Like?" (Follow-Up)]

[Text] Several months have passed since STROITEL'NAYA GAZETA (No 66) published the press-club materials. And today, having received replies from the deputy chairman of RSFSR Gosstroy, Yu. Bukin, the secretary of the board of the USSR Union of Architects, G. Il'inskiy, and a member of the committee, as well as the chief of administration of Gosgrazhdanstroy, O. Zhagar, the editors can inform the readers about the solution of a number of problems which were set forth at the press-club session.

What will rural housing be like in the next few years? That is approximately how one could formulate the agenda of the conference held in Gosgrazdanstroy with the participation of the Union-republic Gosstroys. Their presence was to be explained by the exceptional importance of the topic under discussion; based on the results of the latter, a number of decisions were taken. One of these, perhaps, deserves to be dwelt upon in greater detail.

To conduct an analysis of the standardized and individual plans to be used in rural areas for residential buildings--the task entrusted to the Union-republic Gosstroys--sounds quite dry and business-like. But behind its laconic quality there stands a great deal of research. To extract from the archives the appropriate engineering documents and to examine them from the viewpoint of contemporary requirements for housing: so that the latter may be warm, economical, suitable, and appropriate to the demographic make-up of the population--that is what stands behind this research work.

It has already been completed in the Russian Federation. The zonal institutes have thoroughly analyzed 1200 housing plans and about 400 plans for cultural and everyday-service buildings. Subsequently, in the RSFSR Gosstroy under the chairmanship of M. Babin, for every kray, oblast, and autonomous republic a list of housing plans was approved for building up rural populated points during the years 1983--1985. Taking part in such a responsible procedure were representative delegations from the localities, headed up, as a rule, by the deputy chairmen of the oblispolkoms, as well as specialists from Gosplan, the Ministry of Agriculture, the Ministry of Rural Construction of the republic, and the Roskolkhozstroy Association.

The results of this serious and important work have been drawn up in the form of official documents. They legitimize the structure of building up the rural areas during the remaining three years of the five-year plan. And these figures are extremely interesting. Practically everywhere multi-story apartment houses are being replaced by farmstead-type houses. Their number ranges from 75 to 90 percent in the villages of Krasnoyarskiy, Khabarovskiy, and Staropol'skiy Krays, the Tatar, Bashkir, Udmurt, and Chechen-Ingush ASSR's, the Omsk, Perm, Rostov, Tambov, Tula, Moscow, Saratov, Penza, and other oblasts. In Chita Oblast it has been decided to erect only farmsteads, whereas in Leningrad Oblast the preference, as before, is being accorded to multi-storey housing; here only one house out of ten will be of the farmstead type.

The documents have legitimized the list of projects for the state, cooperative, and individual construction. On an average, for a kray, oblast, and autonomous republic it includes 25--30 types of buildings. And something which is very important: the output of parts and structural components for them has been fully organized. Reliance has been placed not only on the production base of the rural builders and the possibilities of the economic method but also on the aid of the urban DSK's [Home-Building Combines]. Today this aid has become a reality. The planners have issued documentation on rural housing in the following series: 121, 83, 84, 464, 90, 75, 125, 99, and 97. And the combines have mastered the output of single-storey structures.



In each of the documents attention is drawn to the following notation: "It is permitted to complete during 1983--1984 the building of houses using plans which had not been made a part of this list if the planning and estimate documents have been turned over to the client prior to 1 July 1983 and the facilities have been included in the construction plan." The meaning of this may be deciphered as follows: plans not included on the list are not being financed by the local divisions of USSR Stroybank.

The USSR Union of Architects has also contributed its own bit to raising the architectural level of rural housing. Revue-type contests for the year's best architectural project and plan, the creative reports of the planning organizations, public inspections and discussions with representatives from the kolkhozes and sovkhozes have all assisted in bringing about positive shifts in the building up of rural areas.

The efforts of Gosgrazhdanstroy are now aimed at stepping up the development of normative specific capital investments in the construction in rural localities of housing, socio-cultural, and community-type facilities. With the conversion to a mass building of farmsteads, housing costs are sharply rising, and there is an equally sharp increase in the need for improving volume-planning, construction and engineering solutions, as well as for the widespread use of local building materials (arbolit, lightweight concrete, products made with a gypsum binder, etc.).

More than 40 institutes have been drawn into this work, which must be completed in the very near future. In order to help them, the TsNIIEP (Central Scientific-Research and Planning Institute for Standardized and Experimental Planning) of Grazhdanstroy and the TsNIIEP of Engineering Equipment have prepared methodological recommendations, coordinated with the departments of agriculture and procurement, housing and community services, and the consolidated department of capital investments of USSR Gosplan.

#### Simple Farmstead Plan Introduced

Moscow IZHITEL'NAYA GAZETA in Russian 21 Aug 83 p 3

[Article by V.I. Akhionov, special correspondent: "A Mansard To Your Liking"]

[Text] In accordance with the decisions of the 26th CPSU Congress and the May (1982) Plenum of the Party Central Committee, a broad-based program of rural social development is being carried out in the country. There is growth in both the volume and rate of housing construction. The course aimed at building farmsteads is becoming ever-firmer, and new possibilities are opening up for cooperative and individual housing construction.

Today we are opening up a new column--entitled "Architectural Showcase." Its goal is to acquaint readers with interesting rural plans for housing, civic, cultural, and everyday-life purposes.



Today we are going to acquaint our readers with a single-family, four-room, farmstead-type house with a garage. The motto of the house's plan is "A Mansard To Your Liking."

Such houses have already been built on the Nara and Povadinskly Sovkhozes, and, therefore, we can take a brief tour through one of these houses. The director of Mosgipronilisel'stroy, A. Mironshchenko, agreed to be our guide.

"Very obviously," Aleksey Stepanovich stated, "we must begin with the fact that this house (we call it a 'growing' one) is fully fabricated and consists of consolidated elements. The foundations under it are made by the drilling-tamping or the shallow-depth methods: a reinforced-concrete band 40 cm wide runs around the perimeter of the building; placed under this is a cushion of sand at the depth to which the soil freezes. The 'bublik'-type panels are made of single-layer keramzit concrete and have a high degree of plant manufacture. But they may also be made of gas silicate, arbolit, or other effective building materials. The partitions are made of gypsum concrete and the ceilings--of reinforced concrete. The roofing is made of corrugated asbestos-cement sheets."

Here we interrupt Aleksey Stepanovich's narrative in order to direct the reader's attention to the roof of this farmstead-type house. The fact of the matter is that it is not at all the usual type--prefabricated-disassembled. All its elements, as well as the mansard and the veranda partitions, are manufactured and assembled in blocks under plant conditions. Then these blocks (there are four of them in all) are loaded onto two trailer-trucks and hauled to the construction site. Here a crew of carpenters, consisting of three persons, installs them with the aid of a crane during the period of one shift.

"It should be noted," continued A. Mironshchenko, "that the house is quite well-proportioned with regard to its facade. Thanks to this, we have succeeded in significantly improving the volumetric-floor-planning parameters of the building's individual rooms. And the finish of the facade itself is simple and laconic--strictly functional. The gable on the roof, the overhang on the porch, the framing of the windows, and certain other details impart the coloring of a rural, farmstead-type house."

At this point some readers may think of the following matter: industrially produced, farmstead-type houses, of course, have their merits, but they all have one essential shortcoming--they are all very similar with regard to their architectural solution. Who has not encountered if not entire village streets, at least houses on one which are as similar to each other as two drops of water? Of course, in the industrialization of rural housing construction and the increased degree of plant manufacture of parts and structural components, it is complicated to preserve the individuality and architectural uniqueness in the facades of the farmstead-type buildings.

The specialists of Mosgipronilisel'stroy have found a way out of this dilemma: they have developed several variants of the decorative elements; these permit us to obtain the most diverse architectural solutions. Moreover, these elements can be made of wood, gypsum, arbolit, reinforced concrete, or other materials, and they can have various color solutions.

"Now let me invite you into the house," said Aleksey Stepanovich. Through a wicket gate in a low wall made of beautiful ceramic blocks we stepped up onto the porch.

The finishing of the interior areas is completely up to the qualitative standards of urban apartments. The floors, as a rule, are parquet; the walls are covered with contemporary wallpaper, while the kitchen and bathroom are faced with glazed tiles.

The house has provided for two variants of heating and hot-water supply: either from the settlement's boiler unit or from an autonomous one. Food is cooked on gas ranges, and in the absence of gas--on electric ranges. A characteristic trait of this one-family rural house, furthermore, is the fact that it may be entered not only through the so-called formal entrance, as we did, but also from the side of the farmstead plot, which is very convenient for conducting one's private, auxiliary farming. With this purpose in mind, provision was made for an exit from the kitchen to the veranda and from the latter--to the farmstead plot. It may also be used to pass out of the hayloft, thereby by-passing the rooms.

The house is indeed a fine one. But it was not clear to me why it was called the "growing" one.

"The fact of the matter is," answered Mironshnichenko, "that, if the builder so desires, the contracting organization can erect the building's framework and finish off only the first storey. In that case, the house would have two rooms, and the estimated cost would amount to approximately 13,000 rubles. But a future owner could convert it by his own efforts into a four-room house, utilizing the area under the mansard roof for this purpose. The partitions are already there. What is required is to lay the floors, insert the door units, install the engineering equipment, introduce electric lighting, and carry out the finishing operations. And as regards the stairway from the hall of the first floor, it is assembled of ready-made parts produced in plants. Calculations have shown that for this purpose a builder would require about an additional 1,000 rubles.

To what had been stated Aleksey Stepanovich had a bit more to add. The living space of this house is 55.8 m<sup>2</sup>, while the total space is 99.2 m<sup>2</sup>. Nor is there any particular confusion about its estimated cost. As is known, when kolkhoz members and sovkhos workers enter into a cooperative, the state grants them some specific privileges. And these privileges are extremely significant; let's say the initial contribution payment is made during the first three years, and the remaining portion is amortized by the future owner over the course of 25 years.

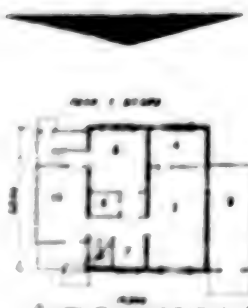
The plan of the farmstead-type house was executed in Mospromstroi'stroy in collaboration with the specialists from the Design Bureau for Reinforced Concrete Ineni A. A. Yakushev. The production of the building has been mastered by the Bunkovskiy Experimental Plant of the Main Moscow Oblast Administration for Building Materials.

This institute's group has on several occasions been a prizewinner in the All-Union Contest for the Best Build-Up of Rural Populated Places. Its projects have been awarded prizes of the USSR Council of Ministers and the Leninist Komsomol, as well as medals of the USSR VDNKh (Exhibition of USSR National Economic Achievements).

For several years now Mongiproselstroi has had practically no complaints from its clients regarding its projects. On the contrary, it has received numerous expressions of gratitude for plans fulfilled on schedule and with a high level of quality. Such was the case, for example, with the plan for reconstructing the central farmstead of the renowned village of Kashino, the creation of social centers for small villages, and other projects which have issued forth from the walls of the Institute.



СТРОИТЕЛЬНЫЕ КОНСТРУКЦИИ	
Фундаменты — свайные	
Стены — керамзитобетон- ные панели	
Перекрытия — железобетонные плиты	
Перегородки — гипсобе- тонные панели	
Кровля — волнистые ас- бестоцементные листы	
ИНЖЕНЕРНОЕ ОБОРУДОВАНИЕ	
Водопровод — от посел- ковой сети	
Канализация — в посел- ковую сеть	
Отопление и горячее во- доснабжение — при сети; иначе автономное	
Пищеприготовление — га- зовые плиты, а при отсут- ствии газа — электроплиты	
ЭКСПЛИКАЦИЯ	
1. Общая площадь	21,4 кв. м
2. Спальня	14,2 кв. м
3. Спальня	11,2 кв. м
4. Спальня	9,8 кв. м
5. Кухня	12,9 кв. м
6. Совмещенный санузел	3,3 кв. м
7. Передняя	10,0 кв. м
8. Холл	10,2 кв. м
9. Гарей	17,9 кв. м
10. Веранда	12,6 кв. м



## Structural Components

Foundations---pile-type

Walls---keramzit-concrete panels

Ceilings---reinforced-concrete slabs

Roofing---corrugated, asphalt-cement sheets

## Engineering Equipment

Water pipeline---from the settlement network

Sewerage---into the settlement network

Heating and hot-water supply---autonomous within the gas network

Food preparation---gas ranges, and, in the absence of gas, ground-level electric ranges

## Legend

1. Living-room	21.4 sq. m
2. Bed-room	14.2 sq. m
3. Bed-room	11.2 sq. m
4. Bed-room	9.0 sq. m
5. Kitchen	12.9 sq. m
6. Combined bathroom	3.5 sq. m
7. Foyer	10.0 sq. m
8. Hall	10.2 sq. m
9. Garage	17.9 sq. m
10. Veranda	12.6 sq. m

## Rural Construction Deputy Minister Interview

Moscow STROITEL'NAYA GAZETA in Russian 31 Aug 83 p 2

[Interview with Ivan Yakovlevich Semenov, RSFSR deputy minister of rural construction, by Vl. Akhlomov, correspondent: "The Experiment Is Beginning"; date and place not specified]

[Text] Last year STROITEL'NAYA GAZETA conducted a discussion on the experience of organizing work at rural construction sites by the economic method and ways of improving it

in the light of the decisions of the 26th CPSU Congress and the May (1982) Plenum of the CPSU Central Committee. Many specialists manifested a sincere interest in the discussion of these problems, and they made specific suggestions, most of which were published in the newspaper. In particular, the STROITEL'NAYA GAZETA readers' council, as well as the directors of a number of ministries and departments, considered it worthwhile to pay particular attention to the suggestion regarding the so-called mixed mode of construction.

Three ministries of the Russian Federation--the Ministry of Rural Construction, the Ministry of Agriculture, and the Ministry of the Fruit and Vegetable Industry--have worked out and approved a Provisional Statute, which regulates the procedure for the participation of the enterprises and organizations of these departments in the joint construction of facilities of the agro-industrial complex. This document is directed at increasing the volumes of contracting work in the rural areas, more complete utilization of the capacities of industrial enterprises, and the reduction of the volumes of work being carried out on Russia's kolkhozes and sovkhozes by means of the economic method.

A STROITEL'NAYA GAZETA correspondent met with the RSFSR deputy minister of agriculture, I. Semenov and requested him to answer a number of questions connected with the adopted Statute.

[Question] Ivan Yakovlevich, have the opinions of readers concerning improvements in the economic method been reflected in the Statute, which was approved by the three ministries involved?

[Answer] Certainly. This document is a direct embodiment of those suggestions which were expressed by STROITEL'NAYA GAZETA's readers during the course of last year's discussion. Many of them noted with complete justification that the lengthy time periods of our principal clients--the RSFSR Ministry of Agriculture and the RSFSR Ministry of the Fruit and Vegetable Industry--has not reduced the proportion of work carried out by our own efforts. Moreover, these amounts are extremely significant. Let me cite an example for the sake of clarity. In the plan of the current year for the Russian Federation's Ministry of Agriculture this indicator has reached 21 percent. In monetary terms this amounts to almost 900 million rubles.

And no, for kolkhozes and sovkhozes to carry out such volumes of construction and installation work is very difficult and, at times, even impossible. Here is why. In the first place, they do not have the appropriate material-technical base--ZhEI [Reinforced-Concrete Product] plants, carpentry items, heavy-duty equipment and vehicles, or mechanical-repair enterprises. And this is understandable. They have other tasks--to engage not in construction but rather in agriculture. In the second place, within an almost identical structure per one million rubles for the economic method considerably less materials are allocated than to us, as contractors.



This is one aspect of the problem which was pointed to by the readers of STROITEL'NAYA GAZETA during the course of the exchange of opinions regarding improvement of the economic method. But there is also another aspect. In our ministry today a situation is shaping up whereby in a number of areas we are not fully utilizing our own production resources. For the most part, this is because of a manpower shortage.

And on many farms, when the seasonal, agricultural operations are drawing to a close, there appear quite a few free hands. It is precisely, therefore, during the winter that the modest-sized kolkhoz brigades of builders are supplemented by field workers and machine operators. These groups build technically simple projects for their own kolkhoz or sovkhoz by their own efforts. Such construction, as a rule, is dragged out for a lengthy period of time and is conducted by rather primitive, handicraft-type methods.

STROITEL'NAYA GAZETA has many readers, and we have profoundly studied and analyzed their suggestions. Here we have seen a way out of our dilemma as follows: to permit contracting organizations to conclude agreements for carrying out specific types of work on facilities being erected by our own forces.

We in the ministry have likewise long been working on this idea. And here too we have received powerful support from the clients. Thus, by our joint efforts, with the active cooperation of RSFSR Gosstroy and Gosplan, as well as that of the Russian republican offices of USSR Stroybank and Gosbank, we worked out the "Provisional Statute on the Procedure for the Participation of Enterprises and Organizations under the RSFSR Ministry of Agriculture and the RSFSR Ministry of the Fruit and Vegetable Industry in the Joint Construction of Facilities by the RSFSR Ministry of Rural Construction."

[Question] And wherein lies the essence, the principal idea, of this document?

[Answer] It is simple. The organizations under of the RSFSR Ministry of Rural Construction take on the task of performing operations on projects with regard to installing the foundations, frameworks, walls, ceilings, roofs, and roofing, installing window, door, and gate units, as well as certain other types of operations in accordance with agreements made with the clients, i. e., with the RSFSR Ministry of Agriculture and Ministry of the Fruit and Vegetable Industry. It should be noted that we accept these amounts into the plan of contractual operations above and beyond the limits established by the five-year plan.

[Question] That is, in excess of the plan?

[Answer] It could be stated that way. Let's suppose that in a certain oblast provision had been made for the assimilation of a million rubles, for example. In addition to this, with regard to the mixed mode of construction we take on, let's say, another 300,000 rubles. We include them in the plan, which will now amount to 1,300,000 rubles. And it is based on this total sum that Gosplan will allot us material and technical resources.

[Question] Evidently, your ministry's construction organizations have taken on an additional load. But what are the advantages here, in particular, for the RSFSR Ministry of Rural Construction?

[Answer] The fact of the matter is that the client, in assigning the task of planning projects for joint construction (on these same 300,000 rubles) must provide for the use of structural components, items, and parts to be manufactured by our ministry's plants. In this way the increase in the volume of contracting operations in joint construction makes it possible for us to significantly improve the utilization of the capacities of industrial enterprises, as well as to more precisely regulate the load of the construction administrations and trusts.

But this is still not all. Our organization's group erects the framework of the building--a livestock-breeding area, an independently standing cowshed, a grain-storage facility, or any other project provided for the mixed mode of construction--while all the finishing operations, i. e., painting, installing the simple types of engineering equipment, public services and amenities, etc., are handled by the client--the farm involved.

[Question] And so it turns out that the client acts as a kind of sub-contractor to you as the general contractor. Is that not rather unusual?

[Answer] Indeed, it is. But, on the other hand, it provides certain conveniences and advantages to the client. Principal among these is the fact that he is spared from such a troublesome task as using his own forces.

[Question] But will not the result be that on kolkhozes and sovkhoses some building frameworks will stand there, along with other projects not ready for use?

[Answer] Such dangers have also occurred to us. We must assume, however, that they will not happen, the simple reason being that every farm director is vitally interested in the construction of his own projects, those which are extremely necessary to him. Furthermore, they are included in his plan, and for not fulfilling the latter he would be held strictly accountable.

[Question] Just one more question. Why is the Statute which we have been discussing a provisional one?

[Answer] Neither we nor our clients have experience in such joint construction. After we have worked with this method for a while, practical problems will arise; we'll make a few refinements and additions to the Statute if that should prove necessary. The requirements for the mixed mode of construction are approximately the same as those for the ordinary, contract type of method. The amounts of work performed by the general contractor by means of his own efforts are credited by USSR Srobybank in the established procedure. The amounts of work performed by the sovkhoses and kolkhozes in accordance with sub-contracting agreements made with us are financed by institutions of USSR Gosbank from the accounts of the client. The final settling of accounts between the contractor and the client will be made after the construction work on the projects in question has been completed.

For 1984 the RSFSR Ministry of Rural Construction intends to utilize the mixed mode of construction to perform, in accordance with agreements made with clients, appropriate amounts of construction and installation work on various farms of the Russian Federation. Later it is planned to steadily increase the volume of this kind of work.

#### Unnecessary Foundation Construction Scored

Moscow SOVETSKAYA ROSSIYA in Russian 23 Aug 83 p 1

[Letter by A. Ganov, Orenburg Oblast: "House Built on a 'Golden' Foundation"]

[Text] Recently I had occasion to visit the Kumakskiy Sovkhoz in Orenburg Oblast. A new street has come into being here, consisting of single-storey, panel-type, cozy little houses. On the outside they are not very different from each other. But those which stand along the right-hand side of the street cost the farm almost a third more. How can such a difference be explained?

As is well known, in the cost of a building a rather large portion of the outlays is accounted for by the foundation. And here it turned out that the houses which were less expensive had been set not on the traditional band-type foundation but rather on the drilling-and-tamping kind, which is more economical. They were erected by a long-standing contractor of this sovkhaz--the group of the Novoorskaya Mobile Mechanized Column No 214.

But if the advantage was so obvious, then why were the houses on the right-hand side of the sovkhaz street built differently? Another department worked here--the Orskzhilstroy Trust of Glavorenburgstroy. If this were an isolated episode, then, perhaps, it would not be worthwhile to mention it. But the fact is that most of this oblast's contracting organizations build the same way as the above-mentioned trust.

Today rural houses in the oblast are erected most often in accordance with the plans of the following local institutes: Orenburggrazhdanproyekt, Orenburgsel'khozproyekt, and Yuzhnouralgiprostroy. The approach taken by the specialists of these institutes to the mass build-up of rural areas has proved to be, to put it mildly, extremely original. Without any further ado, they have "torn out" of the plan for an urban house the first floor along with the base and foundation, covered it with a roof and offered it to builders and clients. This variant, no matter how paradoxical, was accepted. It proved to be unnecessary for home-building combines to re-structure their plant lines; it was also convenient for the brigades of installation workers--for a long time they had their hands full with such a series; and even the clients were easily convinced of the fact that it was precisely this variant which would allow them to carry out the build-up of the rural areas much more rapidly. And the work began to hum. Under single-storey, detached houses they dig deep pits--down to 3 meters--that is what the plan specifies. They lay in them massive, block-type foundations in several rows. For example, on the Samorodovskiy Sovkhoz a branch of the Yuzhnouralgiprosel'khozstroy Institute prescribed that even lightweight, wooden verandas should be placed on heavy-duty foundation blocks, capable of supporting an urban skyscraper. The Orenburgplodoovoshchkhaz Agro-Industrial Association received from the branch documentation for erecting houses with barnyard structures. For every shed it had to pay the builders no more no less than 10,000 rubles. Why so expensive?

An estimate has determined that the manual digging of earth in trenches under each foundation comes to 112 cubic meters.

And here, most likely, is the best place to mention that, of course, in Glavobrestburgstroy, whose organizations are today engaged in building expensive houses, variants of pile-type foundations have been developed. Based at this main administration, even a branch of the Doyuzspetsfundamenttyazstroy Scientific-Production Association was created; it is obligated to put into practice as energetically as possible progressive foundations for houses. But in the main administration they rejected their own good plans. How could this be? Everything is simple and clear: the more expensive a house is for the client, the more profit there is for the builder. Also included in the cost of their work is the price of the materials being used. This striving to "wring out" extra rubles from the pocket of the client has been involuntarily encouraged by USSR Gosstroy through its own instructions. The "Construction Norms" which it has approved state the following: "Prior to the planning of housing the client must agree on the structural components to be utilized." And inasmuch as the builders are not overly concerned with using inexpensive materials, they will, of course, award their "approval" to the "high-cost" variant. And in the present-day situation with regard to housing the client does not object; he just wants them to build!

And so the builders hide under the cloak of thrifty plans, needlessly sinking expensive blocks into the ground and intensifying the shortage of materials. Is it not time that we put a stop to this faulty practice? All the more so since the oblast has the experience of those same Novoorskiy builders. This is not the first year in which they have erected houses on inexpensive foundations. This PME (Mobile Mechanized Column) group has long worked without losses or over-expenditures, and it accounts for a significant portion of the profits gained by the Orenburgskiy'stroy Administration. Is this not the best proof that "profitable volumes" are far from the main thing for the successful operation of builders? According to the most conservative calculations, a widespread dissemination of the Novoorskiy method will allow us to save hundreds of thousands of rubles every year in erecting houses in rural areas. And this means that the oblast's farms, without expending excess funds, can obtain additional tens of thousands of square meters of housing.

#### General Plans for Village Construction

UDC 631.2

Sverdlovsk URAL'SKIYE NOVY in Russian No 6, Jun 83 pp 58-61

[Article by N. Rudayev, acting director of the Chelyabinsk Oblokolkhozproyekt Institute: "On an Industrial Basis"]

[Text] Depending upon what decisions and plans are adopted, as well as to what degree they will be progressive and economical, are the appearance of our villages, the quality of the houses and socio-cultural facilities, along with the living conditions in the rural areas.

There are 69 kolkhozes in Chelyabinsk Oblast. Fifty settlements have facilities with general plans; however, 35 of them already require adjustment. During the current five-year plan our institute is faced with the task of working



out 29 general plans for rural populated points. The necessity for developing and adjusting general plans has been brought about, in the first place, by their absence in a number of rural areas or by decisions which have become obsolete by now; in the second place, by the increased demands for a high level of architectural-aesthetic appearance and conveniences. Carrying out the restructuring of this oblast's villages is seen by the institute to consist in the gradual transformation of them into up-to-date, populated points which combine comfort and a high level of cultural-everyday services.

A rural settlement should consist not simply of a material-functional amalgamation of various architectural-planning and spatial structural parts and elements, but rather an architectural composition, an integrated ensemble--a harmonious combination within a single artistic whole of all the elements of the settlement and the natural environment. The choice of an over-all compositional idea for the planning and the build-up is determined by the social, functional, and economic requirements as well as the urban-development conditions of the organization of the rural settlement. Compositionally it should be subordinated to the natural conditions, a consideration of which will help to correctly outline the principles of its planning and spatial solutions, to select the place for locating the social center and individual public buildings, to define the profile and the color gamut of the settlement's panorama. In our times the inhabitants of cities are attracted to rural localities not merely by the quietness and the clean air but also by the striking diversity and beauty of the exurban landscapes.

To a large extent, the appearance of a village and the level of its conveniences depend on how the build-up is carried out. If it was previously carried out primarily by means of individual buildings, now it is conducted in a comprehensive manner. This means that simultaneously with the erection of production facilities, convenient housing and service facilities are being created, along with engineering utilities, improvements, and amenities. Moreover, utilitarian tasks must be combined with aesthetic ones. Technically literate, economically well-grounded general plans for rural settlements ensure the formation of expressive architectural ensembles.

Serving as examples of successful building in accordance with our plans are the villages of Kirsa, Verkhneuralskiy Rayon, Siniy bor and Petrovskoye, Uvel'skiy Rayon, the settlement of Syrtinskiy, Kizil'skiy Rayon. In the center of the village of Kirsa there arises an entire ensemble of social buildings (a new club with 300 seats, an administrative building, a school, and stores), successfully situated within the system of the entire populated point. Its construction will be completed with the erection of a new administration building and sports gymnasium; but even now the center has a compositional tie with the river, with the zone of rest and recreation, and a boulevard is in the process of being formed.

One of the best in the oblast is the central farmstead of the Rassvet Kolkhoz, Uvel'skiy Rayon (see photo on inside front cover); the settlement of Siniy bor is located in a pine forest not far from the city of Yuzhneuralsk. The compactness, the micro-climate which has been created within the forest environment, the presence of service-type institutions, the provision of heat for the houses, the intensified new housing construction and amenities for the



villages, along with good transportation connections with the oblast and rayon centers, have all created the prerequisites for splendid living conditions. It was not by chance that in the All-Union Contest for the Best Build-Up and Amenities, conducted in 1981 at the VDNKh [Exhibition of USSR National Economic Achievements], this settlement received a Third-Degree Diploma and a bronze medal.

However, the degree of influence of the measures being carried out for the formation of the villages' architectural appearance does not yet correspond to the scope of the construction operations. As was the case before, monotony and a lack of individual distinction are inherent in many new construction projects. The building up of rural areas is, unfortunately, being carried out by means of uniform, unexpressive, two-family houses; but up to now few one-family houses have been built, although their products list is diverse.

In our opinion, the appearance of villages is adversely affected by the use of a zonal system, which, while permitting some reduction in the time period and cost of planning, does not allow solution of the problems of coordination with the existing build-up and the engineering networks. Furthermore, this leads to a de-individualization among the oblast's villages, since the clients and the builders have only one variant of a brick house to choose from.

While basically adhering to standardized plans, we are introducing and creating individual houses of the farmstead type with all the barnyard structures. We have developed an experimental house with a complete set of farm areas and engineering support; it is based on the "Yral'sk Little Farmstead" type and ensures a convenient approach to the farm buildings in any weather conditions; it also creates a maximum of conveniences for the inhabitants.

In conjunction with the Chelyabinsk Institute of the Mechanization and Electrification of Agriculture we have created a plan for an experimental, one-family house of the farmstead type, based on the principle of the "thermos house," with a single energy input. At the present time the institute is working out a variant plan for a single-family house of improved planning to be made of large blocks of plant manufacture (Photo 1).

The interior finishing of the house is carried out at the plant. Ready-made blocks will be delivered to the construction site for the living rooms, toilet, and bathroom, the kitchen with its entry-way, the basement blocks with their storage areas, and blocks for the farm buildings. Operations with regard to erecting the house will boil down to installing these structural components, and this will significantly reduce the time period required as well as increasing the quality of construction.

Work is nearing completion on the development of a plan for a one-, two-, or three-family house, made of Series 25 panels (Photo 2). Situated on the first floor of this house are the living rooms, kitchen, bathroom, and toilet. The animal-feed kitchen, storage areas, and garage are planned to be located in the basement. The planning of this house uses many of the energy-conserving ideas of the "thermos-house." In comparison with the standardized plan, the products list of panels has been reduced.

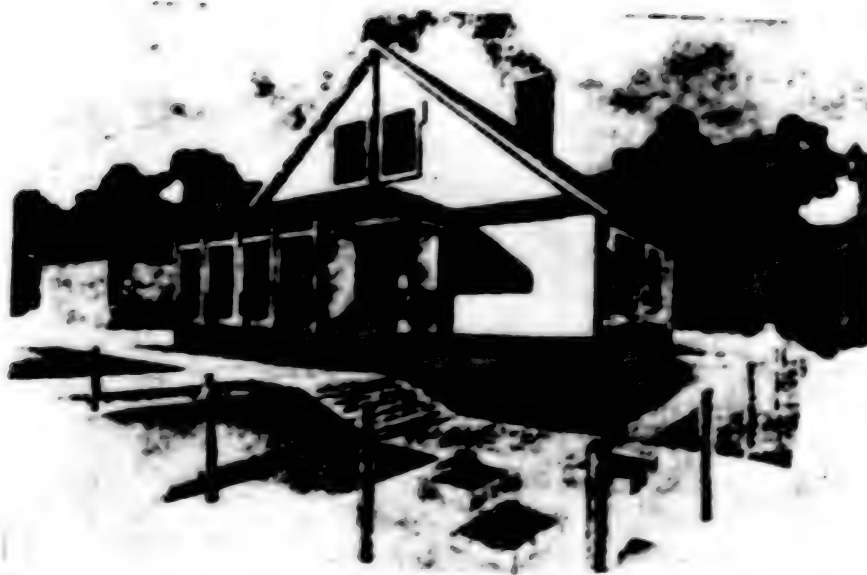
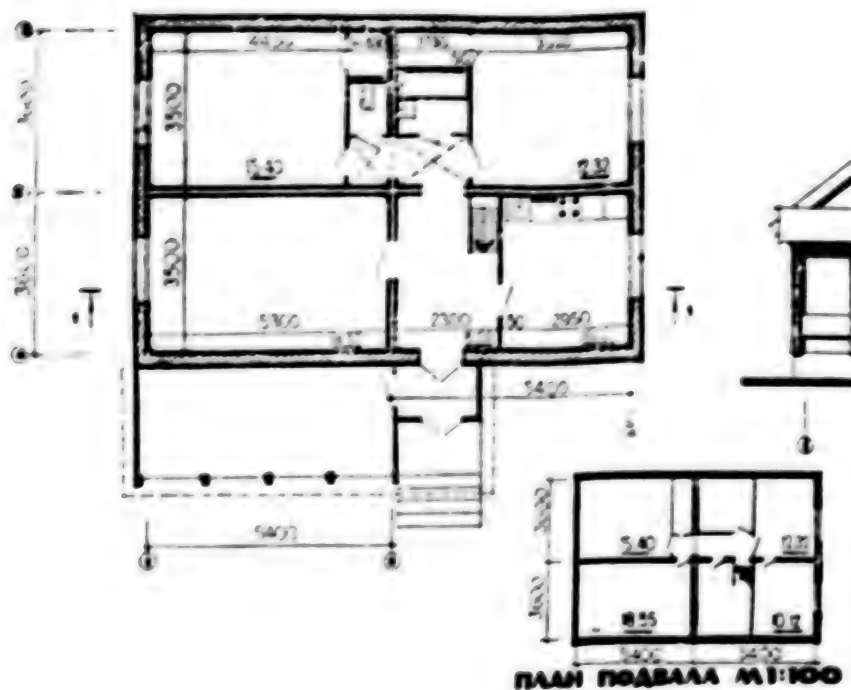


Photo 1. Plan of House Made of Large Blocks (Frontal View)



Draft Plan of House Made of Large Blocks

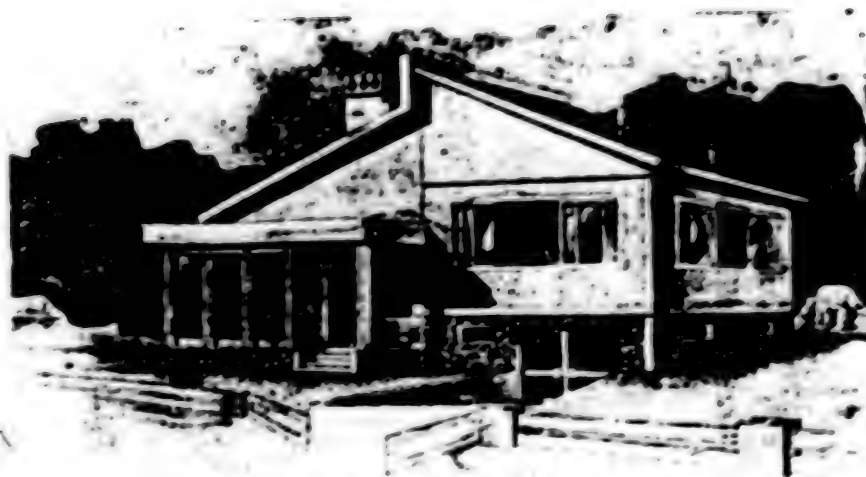
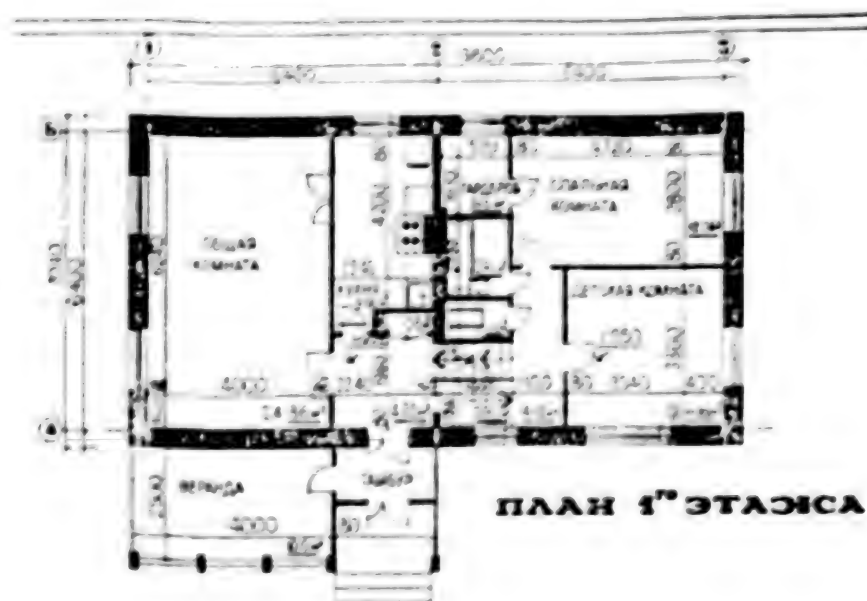


Photo 2. Draft Plan of House Made of Series 25 Structural Components  
(Frontal View)



Draft Plan of House Made of Series 25 Structural Components

A great deal of attention has been paid by the institute to the aesthetic expressivity of the build-up, to the smaller architectural forms, to the amenities and landscaping. In 1982 an album of the smaller architectural forms was published; by using it the clients are able to pick out the standardized solution or order an individual development.

The progressive farms of this oblast, in according great attention to housing construction, also understand the particular importance of its architectural expressivity. We already have orders to carry out plans for the architectural-aesthetic formation of a village. Now for the houses and facilities for social and cultural services variants are being developed for finishing the facades using local finishing materials and contemporary architectural devices. Along with the plan specifications, the client is provided with a record of the color schemes of the exteriors and interiors, as worked out on the drawing board.

It should be noted that the efforts of the institute aimed at improving the architectural-aesthetic appearance of the village have obtained extremely tangible results. As an example we can cite the club with 400 seats in the settlement of Poletayevo, Sosnovskiy Rayon, built in accordance with Standard Plan 264-12-128. A successful placement in the locality and the color solution of the club's facade against a background of greenery, combined with a high quality of construction work, all leave a pleasant impression. Good solutions were found for the club's interiors with the use of multi-colored ceilings.

In selecting a site on which to build a House of Culture with 400 seats in the village of Varlanovo, Chetarkul'skiy Rayon, consideration was given to its organizing importance as a socio-cultural center (see the photo on the inside front cover). It stands out to good advantage among the surrounding buildings. Local building materials were utilized in the finishing operations. The House of Culture has participated in the oblast revue-contest for the best civic building in the village.

The facades of the kindergarten in the village of Oktyabr'skoye were successfully resolved with the use of silicate, red bricks, and glass blocks (photo 3). In finishing the facade of the House of Culture a good combination has been made of silicate and red bricks, along with decorative elements made of colored metal and ceramics (photo 4).

At the present time the forces of the Chelyabotlkolkhozstroy Association are using for construction standard plans with structural elements made of small-unit material--bricks and slag blocks. This has been caused by the lack of a base for manufacturing wall blocks and panels, industrial partitions. With the introduction into operations of the Troitskiy Construction Combine there will be a rise in the level of complete fabrication of projects under construction. It is planned to construct enterprises for completely fabricated home building in the Varnenskiy, Oktyabr'skiy, and Chetarkul'skiy Rayons.

At the same time as the industrialization of rural home building is increasing, research is being undertaken to find ways for curtailing the sizes and types of structural components being used. In the houses of Series 25, for

example, it is intended to reduce their products list from 92 to 30, which will allow the installation time periods to be cut by two-thirds.



Photo 3. Elevator in the Village of Ustyat'skoye

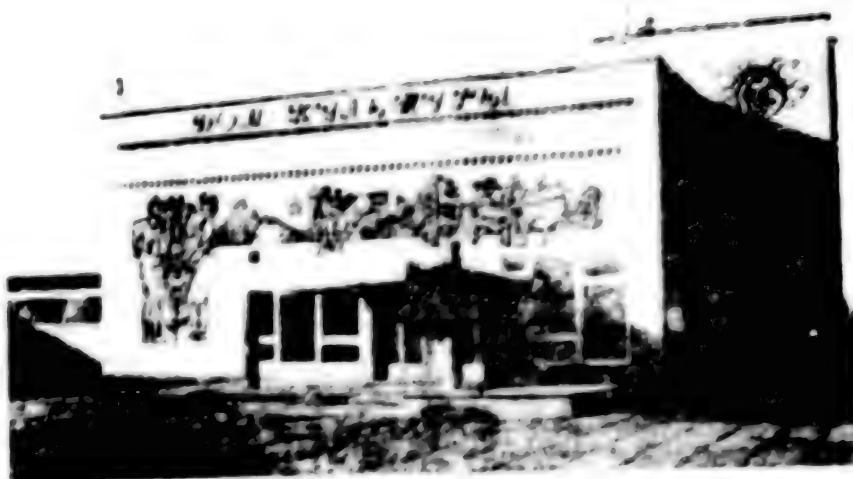


Photo 4. House of Culture of the Yul'kovskiy Island Shevchenko in the Village of Ustyat'skoye



In the village of Varma a large-panel, home-building plant is under construction with a production capacity of 38,000 cubic meters of items per year (25,000 square meters of living space). It is designed to turn out 250 sets of two-family houses made of single-layer, keramzit-concrete panels in accordance with Series 25 for the kolkhoses and sovkhozes of the Varnenskiy, Chernenskiy, and Kartalinskiy Rayons. At the present time housing construction by the contract method in these rayons comprises merely 24 percent; with the putting of the plant into operation, it will increase to 70 percent.

In the village of Oktyabr'skoye, Oktyabr'skiy Rayon it has been proposed to build a workshop for the production of standardized, large blocks with a maximum degree of plant manufacture, which provides for a considerable reduction in material, monetary, and labor outlays. The principal structural elements of large-block home building are formed large blocks or semi-blocks from which the house is erected. Provision has been made for a concentration of manpower in the workshop in the matter of finishing and outfitting the block-rooms; this allows a reduction of labor outlays at the construction site.

A decision has been made on the planning and construction of brick plants with capacities of as many as 10 million units of brick using local raw materials on the Kandravinskiy Sovkhoz, Chetarkul'skiy Rayon and the Banner of Ostotser Kolkhos, Uvel'skiy Rayon.

The conversion of rural home building onto an industrial basis, the new architectural-planning devices for building up an area, and the new type of house with its full amenities have all made it necessary to provide it with improved equipment. To plan a house with improved planning is very complicated when the village has neither a centralized water supply nor sewerage. Moreover, it must be taken into account that the specific requirements for a system of engineering support in a rural locality, in connection with the lesser density of built-up areas and the greater length of the utility lines, do not allow us to utilize the experience and technical solutions accumulated in urban construction. Furthermore, there are specific difficulties in a purely economic plan as well.

The universal construction of centralized systems of heat supply is difficult at the present time, and the institute is seeking other ways to solve this problem. In particular, for building up farmsteads they have begun to make broader use of autonomous sources of heat: small-size KChM-2 and KChM-2M cast-iron boiler units. The problem of an autonomous heat supply has found a solution in the experimental plan of the "thermos house."

Further increasing the industrialization of construction and the improvement of housing conditions for the rural inhabitant require a more attentive approach to the problem of purifying drainage, seeking out new diagrams for purifying facilities. Capable of serving as examples are the purifying structures planned by the institute on the Kolkhos imeni 20th CPSU Congress, Troitskiy Rayon, on the Poletayevskiy Sovkhoz, Sosnovskiy Rayon, and on the Bol'shevik Kolkhos, Chetarkul'skiy Rayon. Widespread use has been found for compact units of plant manufacture. They will be utilized on the Kolkhos imeni Karl Marx, Chetarkul'skiy Rayon and on the Urmyak Kolkhos, Arzayashskiy Rayon.

Special attention is now being accorded to amenities for the rural areas. To a great extent, this is being facilitated by the fact that the Institute has standardized the linking together of individual houses and facilities providing social and cultural services, making the transition to developing plans for building up entire districts.

The Pond Program has posed large and complex problems for us. To make our villages amenable and beautiful and our housing convenient, to draw the living conditions in the village closer to those of the city--that is the noble task of the planners and builders.

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## AGRICULTURAL CONSTRUCTION

### PROVISION OF RURAL HOUSING DEVELOPMENTS, SERVICES IN LITHUANIA DESCRIBED

Moscow SEL'SKAYA ZHIZN' in Russian 9 Oct 83 p 4

[Article by special correspondents G. Bogush, V. Kulikov and A. Morgun:  
"130,000 Housewarmings"]

[Text] "...the end goal of our efforts in the economic sphere is to improve the people's living conditions."

Yu. V. Andropov

A persistent and consistent effort is being made in the Lithuanian SSR to move farmstead residents into developed villages consisting of country homes. Each home includes a plot of land and sheds for farm animals and birds.

The central village of "Erishkyay" Kolkhoz, Panevezhskiy Rayon reveals itself to a visitor as a single unit in its full volume. Compact and sensibly planned, it entices with its bright appearance and, on closer inspection, with the meticulousness of trim. Water basins, a combined social center and kolkhoz office, a Palace of Culture, a store, a children's nursery, a school and a dining hall are fitted perfectly into the neat street pattern. And there is more: It is green wherever you look, emphasizing that this is a country settlement. Almost all of the homes--there are about 200 in "Erishkyay"--are single-family residences of the farmstead type. And of course, with all of the conveniences, and inasmuch as these are country homes, they also possess all of the necessary farm structures.

In its time, "Erishkyay" was the 25th farm in the republic in which all farmers were moved from farmsteads into a developed central village. Those times are now remembered only in the names of some of the streets: A small thing, it may seem, but there is a psychological reason for it--after all, it is easier for people to move when the name of their new place of residence remains the same.

The example of the kolkhoz offers much to learn. This is why a plenum of the Lithuanian Communist Party Central Committee was convened precisely here, in "Erishkyay," to examine the problems of rural economic and social development.

Kolkhoz chairman Al'fonsas Gedraytis is a well-experienced leader who understands life and who accepts no compromises and believes nothing to be unimportant when the discussion turns to what is most important--the people and their living and working conditions. Gedraytis was there when this new village was born. Forming its countenance, the kolkhoz invited specialists and professional architects to take part in the development of the master plan for the build-up. The master plan became a document that defined the village's development, and simultaneously that of the farm over the long range. The plan and Gedraytis's persistence helped to keep the redevelopment on the right course from the very beginning.

"I am deeply convinced that concern for production must begin with concern for people," said Al'fonsas Gedraytis. "It will surely repay itself a hundredfold. Our farm is a fabulous illustration of this. After all, it is precisely owing to the village's attractiveness, its personal conveniences and the suitable working conditions it offers that we were able to reduce the population's migration from the countryside to zero some time ago. In the last few years the number of workers in the kolkhoz has been growing, and if we consider the average age of the employable population, the countryside is growing younger."

Special mention should be made of what the people in "Erishkyay" define as "suitable working conditions." It means more than neat, tidy farms that are, without question, fully mechanized. It means more than mechanical shops that are convenient to work in, and in which exemplary order reigns. Incidentally, these facilities are not at all new structures in the village. They are the old farms and shops, but sensibly modernized; they are well equipped, and they will serve the kolkhoz for many more years to come.

The most important thing today in each such production facility is that it provides conditions in which the livestock breeder or mechanic could both work productively and rest comfortably during breaks, and on finishing his day of work, take a shower or bath. This, the kolkhoz chairman believes, is just as important as a cozy home in which to live.

And still more: The land adjacent to the farms and the machinery yards is mandatorily well taken care of. The people in "Erishkyay" are not indifferent to beauty. Fancifully composed flower beds, the joyful greenery of the shrubs, and an unpretentious sign manufactured by a folk craftsman are typical of every work area.

#### Bread and Beauty Right Next Door

A favorite saying of Lithuanian farmers comes to mind: "Bread and beauty are products of the same hands." The example of "Erishkyay" confirms that today's grain farmers are quite sensitive to both the material and the spiritual. Moreover they themselves participate in the creation of both, acting as extremely interested persons.

Their words: "Bread and beauty are products of the same hands"--have become the motto of a traditional competition for best developed rural settlement that has been going on in the republic far more than 10 years. The initiators of

this competition are the republic newspaper TIVESA and the Lithuanian republic council of trade unions. Each year they present a substantial prize of amber to the current winners of the review. Moreover the presentation itself of the prize is a well organized social function, reports on which are heard throughout the republic. Moreover it encourages others to follow this good example.

Journalists and trade union workers are doing a necessary and useful thing, rewarding those who show concern for people today and thus lay a dependable and firm foundation for the future.

The amber prize has had its worthy recipients. Later on, many of the possessors of the prize successfully represented the republic in the all-union arena. They have won various diplomas and prizes of the Exhibition of the Achievements of the USSR National Economy and prizes of the country's Council of Ministers. Settlements that have won such prizes include Zhezhmaryay of Kayshyadorskiy Rayon, Zhelsvyale of Kapsukskiy Rayon, Daynava of Ukmergskiy Rayon, Yuknaychyay of Shilutskiy Rayon and many others. "Erishkyay" has also taken a strong place among them. These villages are like beacons, showing the way to all kolkhozes and sovkhoses of the republic that are rebuilding or intending to decisively rebuild their farmsteads.

There is much to do. Lithuanian agriculture received an unenviable legacy from the old times. Besides the low productivity of the fields, there also remained the farmstead living system. There were more than a sum total of 240,000 small farmsteads in Lithuania. This dispersal became the main hindrance to socialist transformation of agricultural production, and especially to social changes in labor and life in the country. In order that the effort could begin from a firm foundation, large settlements containing all of the personal services and communal conveniences and possessing a high level of culture had to be created as an example.

The methodical way in which the republic tackled this problem, and its emphasis on far-sightedness and down-to-business thinking warrant approval. Plans for laying out and developing the rural settlements were developed for each rayon, and they are periodically refined and amended. The farmsteads are being moved systematically with a consideration for these plans. They also foresee much else: specialization and concentration of production, and the locations of production centers. Depending on the number of residents, the plans also foresee the presence of schools, children's and medical institutions, palaces of culture, stores and dining halls, personal service complexes, savings bank branches and sports facilities in the future.

The results of these efforts have been as follows: The residents of more than 112,000 farmsteads have moved to large developed population centers. The farmstead living system is fading irreversibly into the past, and farmstead residents are parting forever with the unsettled life and with their isolation from one another.

This work is continuing. Dilapidated farmsteads, touched with gray and awaiting their demise, may still be seen in many places. But they are becoming fewer and



fewer in number. It should be noted however that no haste can be allowed in this effort. Resettlement is being carried out only with the consent of the farmstead owners. Those who do not wish to change their way of life (these are primarily the elderly) remain in the farmsteads. As a rule, young families prefer to live in other conditions.

In a word, the basic way of life, toward the alteration of which the efforts of the republic's party organization are directed, was not an easy one, nor is it any easier today. The goal of this effort is to achieve harmonious reorganization of the countryside, and to make maximum use of all local resources and possibilities to intensively develop agricultural production, primarily on the basis of accelerated social reorganization of the rural area. This issue did not come into being all of a sudden, in a single bound. The course itself of life persuaded us that wherever the problems of social development and of raising the culture of production and personal life are solved thoughtfully, energetically and in integration, a permanent work force is created and agricultural production grows significantly.

The demographic situation in Lithuanian villages was unfavorable for a long period of time. During the 10th Five-Year Plan the number of agricultural workers decreased annually by 7,000-8,000 persons. Despite growth in labor productivity, there were not enough workers. This was not that long ago, but we can already say that the energetic efforts of various republic organizations and departments to build the new countryside have produced good results. In the last 2 years the situation has been stabilized, while the rural population is continually increasing in Vilnyuskiy, Kaunasskiy, Akmyanskiy and other rayons.

But perhaps here as well, the obvious leader and unique beacon for all others is that same "Erishkyay" Kolkhoz, and Panevezhskiy Rayon as a whole, in which considerable experience has been accumulated in social reorganization of the countryside.

Panevezhskiy is the largest agricultural rayon in the republic. The rayon's 100 hectares of agricultural land produce 560 centners of milk and 160 centners of meat, while the average milk yield from cows has reached 3,300 kilograms. The profitability of agricultural production exceeds 28 percent.

Describing the achievements of farmers and stock breeders, the rayon's executives invariably turn their attention to the social changes that have occurred. In the last 3 years about 800 families moved from the city to the countryside of Panevezhskiy Rayon. The average age of workers in the principal occupations--milkmaids and tractor operators--was reduced noticeably in the rayon, and 250 of the young rural laborers are studying in rural vocational-technical schools, tekhnikums and institutes. This fall, 5 percent more first-year students enrolled in the schools, and the number of births is growing. Such are the facts, which persuasively show that not only individual farms but the entire rayon is growing younger!

### A Home for Every Family

"Our position is quite clear here," said R. Dabkyavichyus, the first secretary of Panevezhskiy Rayon's party committee. "Even if the material-technical base undergoes continual fortification, growth of agricultural production still depends primarily on people. And a person lives more eagerly and works better in a place where good conditions have been created for him, where he can satisfy more fully his personal and cultural needs."

We began implementing a vast program of social transformation of the countryside in the rayon 8 years ago, when we started enlarging the farms. The plan was to pursue this effort thoughtfully, with an eye on the future. We wanted to build in such a way that all of the necessary social, cultural and personal facilities would be present within the central farmstead of such a farm. We raised our requirements on construction quality.

We directed our main efforts at erecting housing and forming villages. In the last 5 years an average of 70 new homes or apartments were built in each of the rayon's farms. Almost all of them are farmstead-type single-family dwellings. This fact alone provides a true picture of the direction taken in the rayon, and in the republic as a whole, in relation to rural housing construction. All new housing is placed into operation only after it has been furnished with farm buildings. Communal services are developing and growing stronger, since significant changes are also occurring in village utilities: The overwhelming majority of public buildings and dwellings are now being placed into operation with all of the communal conveniences.

Serious attention was devoted to construction of schools and nursery schools for children. Today, two out of every three central farmsteads have a school, and more than half of the kolkhozes and sovkhoses have their own children's preschool institutions. As far as the immediate future is concerned, it is quite clear that by the end of the current five-year plan, construction of children's nurseries in every farm will be completed.

The problem of commercial and personal services was solved in the rayon in precisely the same way. Today, all farms have stores, dining halls, baths and personal service complexes. Only two farms are still lacking palaces of culture. In a word, favorable conditions have been created for people everywhere in the rayon.

"However, personal and housing conveniences represent only one side of the coin," R. Dabkyavichyus explained. The other--all that is associated with working conditions, with the individual's work station and his environment--is no less important. Four years ago a plenum of the party raykom approved an integrated program to deal with this direction. It foresaw various measures for raising the excellence of production, developing the farm grounds, mechanizing the farms, laying roads inside the farms, improving the land and conducting reviews of excellence of production and labor.

Many items of this program have already been fulfilled. In just the last 7 years 42 farms were reconstructed. Preference is now shown to progressive

procedures in animal husbandry, ones which make the work easier and raise its productivity. The entire herd has now been switched to twice-a-day milking, and the animals are now given 2 days off a week. Good and delightful changes are being made in improving the working conditions of mechanics, and the conditions in machine shops.

Concern is just as serious in the rayon for improving the farms and machine shops. Everything is resting on a solid foundation here as well: The work is proceeding on a major scale, according to the plans. Approach roads have been laid to the farms and shops, the grounds of the latter have been paved with concrete or asphalt, and green belts have been created. Special attention should be turned to the latter: Green belts are a mandatory condition.

In general, the approach to the "green architecture" of production centers and residential communities in Panevezhskiy Rayon, and in the republic as a whole, is creative. One would be hard pressed to find a wooden fence in any village. Such fences have been replaced by well-tended ornamental shrubbery that clearly delimits the boundaries of each farmstead. But in contrast to traditional fences, these living fences bring people together, rather than keeping them apart. Setting up these unusual living fences, the residents decided to reject the principle of trying to outdo one's neighbor. As a rule, the farms help the population to landscape the homes, providing a centralized supply of ornamental trees, shrubbery and flowers.

There is one more indicative note: The central settlements of 16 of the rayon's farms border on parks, four of which were founded in the last 2 years. Lakes are few and far between in the rayon, but a solution has been found: ravines have been dammed, and thus 11 artificial water basins have been created, turning into the favorite places of farmers enjoying their leisure time. While modern comforts are being introduced into rural life, the closeness of the population centers to the land, to nature is fully considered: The new housing developments are expertly fit within the surrounding landscape, the air is being kept clean, and the natural wealth is being preserved and multiplied.

High is the pace of construction in the rayon. It is high because the problems associated with transforming the countryside are being resolved in integration with one another. Precise calculations and exactingness toward executors are always at the foundation of success. The build-up of all territories is planned, first of all, within a manageable volume, and secondly, with a consideration for the possibilities these territories allow for both construction work and municipal improvement, irrespective of the source of financing and the methods by which the structures are erected.

Another very rule is that dwellings and public buildings are placed into operation only after the streets are finished and after all leveling and engineering jobs are completed. The improvement efforts usually extend far beyond the area foreseen by the plan, also embracing the territory of future build-up. Thus during land reclamation, drain systems are laid not only through land to be drained, but also in areas reserved for individual construction. This approach is advantageous to all. The rayon's economy wins out as well: In the final analysis, integrated construction is cheaper.

Improvement and landscaping of not only new but also inhabited streets, and of all squares and plazas is constantly within the field of view of local soviets, deputies and active party members. The plans for such work are drawn up by the rayon's department of architecture, and landscaping specialists make up rough plans. It is much less expensive to do it this way than to hire specialized planning organizations. The architectural plans, which can be implemented very effectively, and the volume of which is minimal, are drawn up in such a way as to permit the farms themselves to implement them within 1 or 2 years; constant contact is maintained between the planners and the executors.

A large detachment of specialists who are not as yet frequently encountered in the countryside--forestry engineers and landscape technicians--are laboring in the countryside.

They are the ones who, together with specialists of the rayon agricultural administration and the rayon architect's service, draw up all plans for improving production centers and residential territory. And folk craftsmen and artists actively participate in creating the architectural details, which do so much to decorate today's Lithuanian villages.

Special emphasis should be laid on the fact that the new village layouts are being planned and existing ones are being refined with the most active participation of the rayon executive committee, the rayon architect, the executive committees of the village soviets and the client farms. A special commission studies the details of the layout plans locally, it hears out the opinions of the future residents, and only after this does it make its recommendations to the planners.

#### Uniting Efforts

It cannot be said that the "Panevezhskiy variant" is unique in some way. This approach to the problem is typical of all of the republic's rayons. Of course, not all have progressed as far as they have in Panevezhskiy Rayon, but no one has any intention of turning off the road they have chosen. And this road is being reinforced primarily by the growing material wealth of the kolkhozes and sovkhoses--that is, by their successes in production.

The material base for solving the social problems of today's village consists of the fixed nonproductive capital of the kolkhozes, sovkhoses and other agricultural enterprises. Scientific economists made an analysis of 612 kolkhozes in Lithuania and established that in combination with other factors, the availability of nonproductive capital has the most direct influence upon manpower stability. Hence follows the conclusion that as the personal income of rural laborers increases, the farms must make an effort to channel more assets into the satisfaction of social needs. Primarily into residential and sociocultural construction. RAPC [not further identified] councils are now taking an increasingly more confident part in solving this problem.

"Building new, well-planned and comfortable villages, the main goal we are pursuing is to make the living conditions of farmers equal to those commonly

referred to as urban. While preserving that which is characteristic of small towns, we are concurrently expanding and improving the settlements, creating outstanding personal and communal conveniences within them," said V. Astrauskas, secretary of the Lithuanian Communist Party Central Committee. "This work has assumed wide scope in the republic, and it has become one of the main concerns of the Lithuanian party organization."

In fact, the republic has managed to move almost half of the farmsteads into modern centers. In three five-year plans, 130,000 homes and apartments were built in rural areas. In just the last 2 years 8,500 homes, 127 children's nurseries, 69 dining halls, 47 stores and other facilities necessary to the modern village have been erected.

The scope of the work can be deduced from the fact that over 300 highly qualified architects are now involved in the planning of the republic's rural settlements. And the clients are always offered a broad selection: Fifty standard plans have been drawn up for dwellings built on an individual and a cooperative basis.

The road of industrial methods of rural housing construction is being laid more and more confidently. The production base of such construction is being strengthened so that by the end of the five-year plan, up to 2,000 farmstead-type homes would be built by the industrial method each year. This task has been assigned to the Alitus Housing Construction Combine.

Contracting organizations are performing the bulk of the construction in the countryside. But the republic is not forgetting about the self-help method either. Owing to the initiative and resourcefulness of many kolkhoz and sovkhos directors, the volume of construction and installation being conducted by the farms themselves doubled in the last 7 years. One out of every four facilities in the Lithuanian countryside is now being erected by the self-help method each year.

This experience is valuable in that it is an example of close coordination of the problems of social transformation of the countryside and further development of agricultural production.

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## HOUSING CONSTRUCTION

### HOUSING EXHIBITION IN MINSK DISPLAYS MODELS, MATERIALS

Minsk SEL'SKAYA ZHIZN' in Russian 5 Oct 83 p 2

[Article by A. Gromov, SEL'SKAYA GAZETA special correspondent: "A House for the Rural Resident"]

[Text] Never before have so many booths been devoted to the rural residence as at the on-going building exhibit staged on Masherov Prospekt in Minsk. The exhibits have been greatly renovated and expanded. The visitors are presented with a large and varied selection of projects for residential farmstead homes with different sets of auxiliary accommodations and domestic buildings. Houses made of wood, brick, keramzit concrete, gas silicate and other panels, monolith concrete, and laminate structures are on display. The works of numerous leading republic project design institutes of BelNIigiprosel'stroy [Belorussian Scientific-Research Institute State Project Design Institute on Rural Residential and Civil Construction] and Belkolkhozproyekt [expansion unknown] are shown. These institutes compete with each other in their creative endeavors, craftsmanship, and foresight. Having presented various projects, they seem to turn to the visitors: look, compare, discuss, we are giving you much food for thought...

Important socio-economic transformations in rural life in recent years are reflected in the halls of the exhibit pavilion. These also signify a qualitatively new stage in overcoming the significant differences between the city and the village. Here it is made abundantly clear how through the party's efforts in the development of agriculture, strengthening the economy of kol-khozes and sovkhoses and increasing the wages of farm workers, conditions have been created for the transition to the mass construction of individual and cooperative country residential houses and for the true transformation of villages.

Displays, plane-tables, photography, natural samples and models testify to the fact that the very structure of rural residential construction has changed due to an increase in the portion of low-story farmstead building. It answers the vital needs of the farmers and of agricultural production, and makes it possible to resurrect the best peasant traditions on a new basis. Such an approach is important for keeping workers on the farm and for creating stable collectives of builders in the kolkhozes and sovkhoses.

The exhibitors clearly demonstrate that rural residential construction may be

successfully conducted according to new projects with improved architectural planning and design decisions and increased dimensions of residential and auxiliary facilities. The specialists at the project design institutes have attempted to creatively solve in a single architectural concept all the components of the rural house. For example, terraces, verandas, lodges, balconies, galleries, entryways, socle stories, and other elements and forms included in the volume of buildings using different methods of finishing and painting significantly alter the appearance of the residential house and increase the comfort of the apartments.

The mock-ups and photographs of attractive and improved residential houses in the Zhemchuzhnyy settlement of the Baranovichskiy rayon are most pleasing. A fragment of the building along Gritsevt's Street in this population center is impressive. A special display stand is devoted to the Osovets settlement of the "Rassvet" kolkhoz in the Lyubanskiy rayon. The authors of the project for the compact and expressive residential zone of the settlement are specialists from the Belkolkhozproyekt Institute. The colored drawing boards show comfortable and cozy residential houses built in the "Rassvet" imeni E. P. Brlovskiy kolkhoz in Kirovskiy rayon.

The organization of subsidiary farming near the houses was also reflected at the exhibit. Examples are given of planning decisions for sectors with placement of household structures standing individually as well as in a single unit with the residential houses. This section shows sheds for cattle and poultry, feed preparation facilities, cellars, awnings for hay and fuel, baths, hothouses, and inventory storage facilities.

The exhibition makes it possible to learn much about the development of the house construction base. A significant step forward has been made in the work of industrializing rural house building and in turning it into a mechanized flow-line process of assembling and installing buildings from parts and elements made under plant conditions. This makes it possible not only to accelerate the pace of erecting residential houses, but also to improve their operational and architectural qualities. One may gain an understanding of the large house-building combines which in a single industrial-construction flow create sets of structures, deliver them to the site, and install them. It is evident from the mock-ups that the Ivatsevichskiy, Lidskiy, and Farinotskiy Inter-kolkhoz House Building Combines have mastered the manufacture of large-panel houses of the farmstead type. The Shklovskiy Building Materials Combine, the Berezovskiy House Building Combine, the Molodechnenskiy Reinforced Concrete Products Plant, the Gomel'skiy Wood Laminate Constructions Enterprise and others are increasing their output of parts and structures. A special display stand is devoted to the products of the Zhlobinskiy Large Panel House Building Plant, where production has been fully mechanized. The structures and materials are made on automatic conveyer lines.

Belmezkholkhozstroy [Belorussian Inter-Kolkhoz Building Organization] already has at its disposal capacities for the production of 1,800 farmstead houses per year. Reconstruction and technical retooling of the enterprises will make it possible by the end of the present five-year period to increase the volumes of residential construction. By 1965 the BSSR Minsel'stroy [Ministry of Rural Construction] will provide for the construction of no less than 1,600 farm-

stead type houses. Such a scale has become possible primarily thanks to the widespread introduction of industrial methods based on the typization of buildings and the standardization of their individual elements.

New series of industrial projects for residential farmstead houses are attracting the attention of visitors to the exhibit.

Displays acquainting the visitors with different finishing materials are evoking great interest. Ceramic is displayed which varies in its size, shape, texture, pattern, and color scheme, and which allows finishing residential houses and apartments much more attractively and better than before. Among the exhibits are different ceramic squares for inside lining of houses, as well as facade and decorative ceramic tile.

In the pavilion and in the open area, one may see equipment for the mechanization of roofing and hydroinsulation work, plastering and painting stations, puttying units, and sets of automatic grips. Wall panels, block-rooms, panel ceiling floors and sanitary-technical stalls are also located here.

The exhibition tells how the introduction of the work brigade contract and other progressive labor methods is proceeding in rural construction sites of the republic.

The exhibition plays a great role in promulgating the foremost experience in residential construction. It is very important to organize its attendance by managers and specialists of agroindustrial associations, kolkhozes and sovkhoses, and building organizations. Any farm worker will find much of interest here.

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## CONSTRUCTION MACHINERY AND EQUIPMENT

### KIEV COLLECTIVE PRODUCES CONSTRUCTION EQUIPMENT, USES LASER TECHNOLOGY

Kiev RABOCHAYA GAZETA in Russian 11 Sep 83 p 1

[Article by V. Yatsyna, student in the Department of Journalism, Kiev State University: "By Laser Beam"]

[Text] Progressive technological processes sharply increasing labor productivity and product quality are being successfully applied at the "Bol'shevik" Plant.

Not so long ago, the 75-ton dump trucks working in quarries amazed the world. Today they are already giving up their place to giants capable of taking on up to 220 tons of load. One kind of these machines makes a great impression. Standing next to the wheel which is four-and-a-half meters in height, one can feel all their strength and greatness.

Creating tires for these herculean giants was one of the most complex tasks. The collective from the "Bol'shevik" production association helped in its solution. The shaper and vulcanizer for the outer casing were made here. Mixing viscous materials and synthetic rubbers is a very complex task. Often such heat and stress loads would arise which the operating parts of the mixers could not withstand. The difficulty arose in the chamber. By doubling its size, it was possible to mix 630 liters of material, and a technical solution was found. Half a million rubles -- that is the economic effect given by the new equipment for the production of large-size tires created by the "Bol'shevik" collective.

This is only one of the many modern technical innovations mastered by the enterprise. Production here is individualized. There are many customers. In starting the manufacture of new products, it is necessary to restructure and to rapidly change both the technology and organization of production. Miscalculations lead to defects and to undershipments, and this is inadmissible.

Another complication is that the most varied sectors are consumers of the "Bol'shevik" machines. These include the tire, chemical, and construction materials industries.

It is the builders which have confronted the collective with its next difficult problem. The fact is that under current rates and scales of residential con-

struction, it is expedient to lay linoleum in apartments. However, it is in short supply. The existing technological capacities provide for an output of 2.5 million square meters of linoleum per year. The new production line created at "Bol'shevik" can produce several times more: 10-15 million square meters. One such assembly will provide flooring for 250,000 apartments!

The last units of this line have not yet been shipped to the customer, but the plant shops are already retooling for the output of an automated assembly for the production of power cable with 50mm section which will be sent to Azerbaijan.

"The geography of shipments of manufactured products is expanding," says SKB [Special Design Bureau] Assistant Director Ya. M. Men'. "Equipment with our plant label may be found at numerous enterprises throughout the country. The machines are also in great demand on the world market. They operate in the developed capitalist countries -- Great Britain, Switzerland, Denmark, in CEMA member states, as well as in India, Sri Lanka, and Cuba. Many of the machines exhibited at international exhibits and fairs have been awarded medals and certificates. Thus, the line for the production of high pressure polyethylene, "Polymer-50" won the gold medal at the Leipzig Fair.

It is impossible to manufacture new technology without renewing our own production. This is the dialectics of technical progress.

Presently at the plant, the method of precision parts casting has been mastered in electric slag smelting furnaces developed by the USSR Academy of Sciences Institute of Electric Arc Welding (Imeni Paton). The installation has appeared quite recently, but already more than 25 kinds of parts are being cast on it. The advantages are tangible. The products have minimal allowances. The need for their mechanical processing has practically disappeared. Moreover, it has become possible to change over to precision casting such parts made of grades of steel which are not cast by the standard method. For example, the pinion shaft was previously forged. This operation took several hours, and lathe processing was still necessary after the forging. Now the pinion shaft is "born" on the electric slag casting installation in only an hour-and-a-half. The new technology yields more than a 100 tons of metal saved annually.

Here is a sector with magnetic-abrasive processing of parts. Placed in the machine tool, they rotate between two polar tips. A ferromagnetic abrasive powder is fed into the gaps between them. The invisible force lines of the magnetic field gradually grasp the part in their firm grip. Stretching out along these lines, the minute powder granules form tens and hundreds of thousands of microscopic brushes. It is these which provide microscopic removal of the metallic surface of parts having the most complex configurations. The quality of polishing is excellent. The fact is that a part made by even the most skilled master on a lathe has a roughness or burrs which are invisible to the naked eye. With ordinary polishing using a hard abrasive circle, the cutting of these burrs leads to the emergence of gaps and microscopic cracks.

Magnetic-abrasive processing is devoid of these shortcomings. The brushes quivering in the magnetic-force lines disintegrate the surface burrs so gently



that even under a microscope it is difficult to find any defects on the polished surface. At the same time, the rate of processing is increased by 30 times, while the wear resistance of the part is increased by one-and-a-half to two times.

However, the most impressive technical innovation at the plant is the installation for laser treatment of metals. The microscopic object-glass with its system of lenses formulates a minute beam capable of noiselessly and almost instantaneously cutting through any type of steel. Four seconds are enough for the invisible but powerful beam to temper the surface of a rather large part.

The introduction of magnetic-abrasive processing, electric slag casting, and laser technology yields a significant effect. One lathe with magnetic-abrasive processing alone saves the enterprise 40-50 thousand rubles per year. However, the most important thing is that labor productivity and the quality of manufactured production are increased. This is why machines with the stamp of the Kiev "Bol'shevik" receive the highest consumer evaluation.

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## CONSTRUCTION MACHINERY AND EQUIPMENT

### DESPITE SOME PROGRESS SHORTAGE OF TOOLS PREVAILS

MOSCOW SPOKOINAYA GAZETA in Russian 6 Jul 83 p 1

[Article: "Working Tools"]

[Text] On the exhibition stands of the All-Union Scientific-Research and Planning-Design Institute for Power, Hand, and Construction and Installation Machines (VNIISMI)--the pilot organization in the country for creating working tools--one can see quite a few fine models of hand and power tools which are being turned out for workers in this sector. Particularly tangible successes have been achieved during the last few years by the VNIISMI specialists in developing power tools which possess improved safety characteristics.

Widespread recognition in our country and abroad has been received by designs new in principle of vibration-proof, hand-held machines: electric and pneumatic hammers of various types, drills, concrete breakers, tampers, shock-resistant nail-turners, and others. The models of the vibration-proof, hand-held machines are protected by 125 USSR inventors' certificates, 56 foreign patents, and a number of licenses which have been sold abroad.

Within compressed time periods serial production was set up for the most progressive electrical tools equipped with electronic controls, and this allowed us to bring their production up to 27,000 units in 1982.

Of significant importance for reducing the outlays of manual labor in construction are the projects regarding the creation and development of the production of multi-purpose, universal electric drills, which will allow us to perform as many as ten different operations. This type of tool received high marks in N. Zlobin's Brigade of Leningrad builders, where its introduction permitted a doubling of labor productivity. The production of such tools is steadily increasing. In 1981 the output of all types of electric drills amounted to 5,700 units, in 1982--about 5,800, while in 1983 it is planned to produce 22,000 of them.

Nevertheless, despite these remarkable successes, the situation in the country with regard to working construction tools cannot be called favorable. The products being delivered to the construction projects frequently suffer from poor quality, and, as was previously the case, an acute shortage of many types of tools is still being felt.

The principal ways to increase the output of power tools include the introduction of additional capacities, as well as the renovation and expansion of existing enterprises. For example, expansion of the Daugavpils Elektroiinstrument Plant will enable us to substantially develop the production of universal electric drills, while the renovation of the Yaroslavl Krasnyymayak Plant will make it possible to increase the output of vibrator-units for concrete work which are in particularly short supply. There is a notable increase in the deliveries to builders of pneumatic concrete breakers, hammers, electrical and pneumatic cutting units of various types since the putting into operation of the Beloretsk Power-Tool Plant. However, the construction of the projects enumerated above has been carried out with delays, and this has an effect on the increased output of tools by the existing enterprises of the Ministry of Construction, Road and Municipal Machine Building, inasmuch as their assurance of being provided with cast-iron and blanks has been planned taking into account the introduction of the new capacities.

Further increase in the production of construction and installation tools has also been delayed by ministries in allied fields which have been short in delivering to the enterprises of the Ministry of Construction, Road and Municipal Machine Building complete sets of items and materials: the Ministry of the Textile Industry--specialized plastics, the Ministry of Ferrous Metallurgy--high-grade steels, and the Ministry of the Electrical Equipment Industry--electric motors, small-size switches, and improved types of electric brushes.

It is a well-known fact that the more the quality improves in the manufacture of tools, the longer their service life is, and the sooner the demand for them can be satisfied. Unfortunately, the production people sometimes forget about this. For example, check-ups conducted by the organs of the State Inspectorate of USSR Gosstandart last year have shown that enterprises of the Ministry of the Machine Tool and Tool Building Industry are turning out a significant portion of their products with defects. More than 70 percent of the fitting and installation tools inspected did not meet the requirements of the standards with regard to the quality of heat processing, roughness of the working surfaces, quality of the protective coatings, and geometric dimensions.

Frequently the "green light" is given for defects by the organs of USSR Gosstat, which, in violation of the state standards, deliver poor-quality materials to the manufacturing enterprises. Moreover, from the invoices which are sent out by the supply bases, it is frequently impossible to make out either the brand of the steel, the GOST number, or even the address of the supplier.

On the other hand, the bases of USSR Gosstat are obliged to conduct entrance monitoring controls over tools which have already been manufactured. However, they have not been interested in returning defective goods to the manufacturers, inasmuch as they themselves must fulfill their plan for the quantity of tools sold. Therefore, a considerable portion of the products are delivered to the builder without any check-ups at the bases at all.

Solution of the problems connected with the production of working tools also requires an active opposition to narrowly departmental interests. This pertains

especially to hand tools, only 12 percent of which are being produced today by enterprises of the Ministry of Construction, Road and Municipal Machine Building, while the remainder are being turned out by tens of enterprises of various ministries and departments.

The way out of this situation is to create base organizations which would develop the technology and produce the new models of tools, as well as preparing the standards. Some specific steps have been undertaken along these lines. Thus, the collegium of the USSR Gosstandart adopted a decree on assigning to the USSR Ministry of Ferrous Metallurgy the functions of a base organization for the production of shovels, and to the USSR Ministry of Light Industry--for the production of brushes. But if the metallurgists showed an understanding of this solution, it met with opposition on the part of the Ministry of Light Industry.

There has also been a delay in solving the problem of determining a base organization with regard to the production of the simplest measuring tools: the USSR Ministry of the Machine Tool and Tool Building Industry has stubbornly refused to assume the role of curator. Such an approach to the matter has brought about an acute shortage of measuring tools in the country and their low quality.

Builders and installation workers themselves can accomplish a great deal in eliminating the shortage of working tools. They should improve their accounting, storage, use, and repairs. Examples of this may be seen in the experience of such organizations as Glavsreduralstroy, Glavomskpromstroy, the Minskstroy Combine, and the Petrozavodskstroy and Yuzhtekhnmontazh Trusts. They have created tool establishments and fine repair bases; they have actively introduced sets of norms, in addition to setting up strict accounting and monitoring controls. And, as a result, there has been a noticeable reduction in the shortage of the most types of tools.

The growth of the volumes of construction and installation work in the country, as well as the intensified requirements for their quality, dictate the necessity of creating a reliable tool base. In this matter, which also has an important social aspect, since it is directly linked with the improvement of working conditions, there must be active participation by all the ministries, departments, and organizations involved in the planning, production, distribution, and utilization of power and hand construction tools.

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## BUILDING MATERIALS

### BUILDING MATERIALS WASTE IN RURAL CONSTRUCTION REVEALED

Moscow TRUD in Russian 21 Jun 83 p 2

[Article by V. Yefimov, scientific secretary, Interdepartmental Commission on Economy and Efficient Use of Material Resources, doctor of economic sciences, in column "Claims of Poor Management" entitled "Patrolling Construction": "In USSR Ministry of Rural Construction Serious Shortcomings in Materials Use Exposed"]

[Text] Our country rightfully is called an enormous construction site. Such a scope of construction as we have is not known in any other country in the world. At this scale, economical and zealous management takes on special significance. In fact, each percent of lost concrete, brick or metal materials is converted into a huge loss for the national economy. Staffs of many construction organizations take the lead in prudent, thrifty attitudes toward the people's property. But unfortunately, there are also other cases. This is well evident in the example of enterprises of the USSR Ministry of Rural Construction. On the whole, much is being done to increase production effectiveness in this branch. More economical materials are being introduced, types and methods of organizing work are being improved. In recent years, for example, consumption of rolled ferrous metals has decreased by 6.6 percent, and cement--by 1.7 percent.

However, behind the overall favorable figures, as shown by a thorough examination by the Interdepartmental Commission on Economy and Efficient Use of Material Resources, serious shortcomings in the work of a number of organizations engaged in rural construction are concealed. Merely in the two previous years, so much construction materials were inefficiently used up, or--to tell it like it is--sold "under the table," that they would be enough to complete 250 million rubles' worth of construction-erection work. This is neither more nor less than five percent of the annual budget of the ministry. Let us emphasize: the question concerns illegal operations with materials, rigidly funded and limited. It does not take cunning calculations to draw a conclusion: without these materials an organization of several hundred thousand could not operate in the course of two weeks. And behind these figures are the unbuilt residences, schools, kindergartens and farms.

It is especially alarming that in many organizations this vicious practice is taking on an even larger scale. For example, if in 1982 the management of Khabarovskkraytselinstroy [Khabarovskiy Kray New Construction] illegally sold



62,000 bricks and 62 tons of cement, then only in the first quarter of this year 314,000 bricks and 400 tons of cement "drifted" to the side. This is greater, by a factor of five and seven respectively, than the entire previous year. Alas, such examples are many. As if the construction industry was transformed into a store. Except that the income from "under the table" dealings does not go to the state, but to some supervisor and his assistants. The actions of these dodgers are usually concealed. It is possible, for example, at PMK-265 Permobil'sel'stroy [Perm Oblast Rural Construction] to write off to floor planking five times more lumber than was required. Or, as in the Poltavsel'stroy [Poltava Rural Construction], Krymsel'stroy [Crimea Rural Construction], and Zhdanovsel'stroy [Zhdanov Rural Construction] combines, to draw up inflated orders for cement. Or, as in the case of the RFSFR Ministry of Rural Construction, to write off bricks, mortar, gravel, etc., to units built in the previous year.

Which struggle for the efficient use of resources can be discussed here! Of 76 organizations checked, 20 in all did not have a program for conservation of construction materials.

But, all the same, national economy units need to be built. And they are being built. From what is left, or from that even slightly worse. And this "little bit" leads to colossal losses from waste. For the years 1981-1982 this amounted to 200 million rubles.

Often the cause of waste is poor quality of construction materials. "Is it really possible," they retort in the Ministry of Rural Construction, "to halt construction because of bad bricks?" Not only can they, but they are obligated to do so. It is just as easy for the cook to justify cooking the soup with spoiled meat. The fact is, he could not let the people go hungry.... Why, then, build something and have to rebuild it all over again? This is a high cost to the economy.

However, in many cases faulty construction materials are made by the same workers of enterprises engaged in rural construction. For example, at the Ungul'sk testing ground for reinforced concrete items (Moldavian SSR Ministry of Rural Construction), sand was used for mortar manufacture that was forbidden to be used in the construction laboratory. Another example. Apparently, only one-twentieth of the aggregate of cement in enterprises of MSSR Ministry of Rural Construction are washed, the rest are used contaminated, which drastically worsens the quality of the item. Because of this alone, cement was overused by up to 40 percent. These references up to here seem impossible....

To date, in the USSR Ministry of Rural Construction construction industry enterprises, they continue to produce obsolete construction structures--20 years out of date! If this is taken for the branch overall, then construction of such uneconomical structures is almost 30 percent of the total volume. And their share at the Kievsel'stroy [Kiev Rural Construction] and Vinnitassel'stroy [Vinnitsa Rural Construction] combines is even higher--approximately 80 percent. They are constructed according to yardsticks of a previous era....

A different topic--material storage. You can read accounts of inspections that make you wonder. Kalininsel'stroy [Kalinin Rural Construction]--mineral wool is stored out in the open; Saratovoblsel'stroy [Saratov Oblast Rural Construction]--bricks lie in heaps; Sverdlovskoblsel'stroy [Sverdlovsk Oblast Rural Construction]--wall panels are stored without holders....

Evidently, it would be a mistake to examine the facts of poor management only from the point of view of material loss. The moral damage to the national well-being from wasteful practices is immeasurable. In fact, during meetings in such organizations, from the rostrum they speak of economy, and in practice they do just the opposite. Is it possible to cause great damage by educational work? On this faulty foundation grow additions and fraud....

In the past year, in ministry enterprises there was excessive use of several thousand tons of gasoline and 8,500 tons of diesel fuel. But if accounts of the garages are used, everything is fine. For example, workers at the Uzsels'avtotrest [Uzbek Rural Vehicle Combine] and Voroshilovsel'stroy permitted overruns of fuel, but according to their documentation it appears they were economical. The mechanism is well known: faulty documentation and duplicate records. Often the accounts take on an ever anecdotal form. At the Korshinsk garage only two drivers recorded excess mileage, equal to three trips around the world at the equator!

Inspections have shown that at many enterprises even within organizations of the USSR Ministry of Rural Construction it is necessary to propose rapid and decisive measures to correct the situation, to cut short squandering of resources. In the very near term, it is necessary to develop a special comprehensive program for the economical and zealous use of construction materials in the organization. The question of personal responsibility of each person, regardless of rank or position, for the rotten affair is on the agenda. It appears that USSR Gosplan [USSR State Committee for Material and Technical Supply] will act correctly, having reduced the USSR Ministry of Rural Construction funds for those materials that were wasted.

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### IMPROVEMENTS IN TILE MANUFACTURING TECHNOLOGY DESCRIBED

Moscow STROITEL'NAYA GAZETA in Russian 8 Jul 83 p 3

[Interview with Aleksey Mikhaylovich Rydvanov, chief of the planning and design office, NIISTroykeramika by I. Svirin, date and place not specified, appearing in column "Industrial Means Effective": "Machines Are Employed"]

[Text] Today, ceramic production is an important part in the technological conveyor of the construction materials industry. Its prospects are good: in scientifically-oriented programs, the development, perfection and introduction of high-capacity automated production lines for ceramic tiles and other items is on-going.

On the contribution of specialists in re-equipping ceramics production our correspondent met with the chief, planning and design office at NIISTroykeramika [Scientific Research Institute for Structural Clay Products], Aleksey Mikhaylovich Rydvanov.

[Question] "Science - technology - production." Is this chain working well for you?

[Answer] Completely. NIISTroykeramika is the leading organization in the USSR Minstroyaterialy [Ministry of Construction Materials], responsible for technical policy in this area. The planning and design office of the institute is studying the problems of automation and mechanization of production processes on the basis of progressive technology in high-speed operations for drying and firing tiles. We develop and usually create the technology--prototype equipment--on a commercial basis at the institute and at the Perm experimental-mechanical production plant. Performance is tested by compulsory preliminary run-ups of a model.

And finally, the third step is introducing it into production. Specialists from the institute, planning and design office, and special section providing scientific and technical assistance to enterprises, are the most active of its participants. This was started in the 1960's, when active technical re-equipment of the ceramic tile industry began. The old technology was saturated with a great number of manual operations, performed primarily by women. The work was monotonous and extremely intense.

Analysis showed that improving operating technology and mechanization of all manual operations was impractical. A different method was needed, namely development of principally new technology for the production of ceramic tiles, eliminating heavy manual labor.

In the laboratories of NIISTroykeramika, the search began for new methods of high-speed drying and firing; this was the key to the problem. The success exceeded all expectations: such methods were found, and they reduced the amount of time earlier spent by a factor of ten.

On the basis of scientific recommendations, the planning and design office developed automated continuous-production lines for the manufacture of ceramic tiles, including molding, drying, first firing, glazing and second firing. This was the first assembly line in the world where drying and firing took place not on ceramic slabs, such as is done in Italy and other countries, but directly on the roller conveyor. Together with industrial workers we studied its implementation.

For developing new technology of ceramic tile production, a group of workers at NIISTroykeramika and in industry were awarded a USSR State Prize.

[Question] What do continuous-production lines constructively represent to you?

[Answer] Depending on their production purpose, it fluctuates from 100,000 to a million square meters of tile, and their types of construction fuel are different. There are single-layer and double-layer, with roller, net or combined conveyors. Heat units on the majority of production lines operate on natural gas. And for areas not conducive to this fuel, dryers and furnaces are heated by electricity.

In the ceramics industry, there have already been 150 spray dryers and over 250 automated continuous-production lines introduced. On these lines, over two-thirds of all ceramic tiles produced in the country are made. Output doubled and fuel consumption was reduced from 30 to 50 percent.

[Question] Have all the processes formerly done manually fallen by the wayside?

[Answer] No. Sorting and packing still remain. Machine builders tried to solve these problems, but unfortunately they were unsuccessful.

[Question] When you look at the work of human hands, sorting and packing tiles into boxes, their actions seem simple. Really, can't this work be done by a machine?

[Answer] It's not so simple for one to locate a defective tile in a mass of finished tiles. But we still undertook to solve this problem, though we quickly abandoned the idea of complete automation of the processes. We have accepted as a basic principle, optical mechanical sorting, automatic stacking and mechanical packing in metal containers.

A device was created, an experimental run was tried, and the device was sent to the Kharkov tile plant. The acceptance commission recommended producing a batch of these type units for lines of 400,000 and 800,000 square meters of floor tiles. Having introduced them in factories, up to 200 workers could be freed from manual labor. Unfortunately, in Perm this year only two machines will be made for Kharkov. And Minstroydormash [Ministry of Construction, Road and Municipal Machine Building] has not approached production of this equipment and the outlook is unclear for 1984.

There is still one very important matter of the department I would like to comment on, albeit briefly. We must create such a technological production line with the latest operational technology which, besides economical merits, will also provide a great social benefit--allow the department to switch from three-shift operations to two-shift. The design of such a production line was developed by the planning and design office, built, and is undergoing experimental testing at the institute's experimental plant. We are awaiting the results.

[Question] Currently, a great number of colored and painted tiles are required for decorating buildings and apartments. What are the technical achievements and possibilities in this area?

[Answer] The demand for this type of ceramics grows each year. Much glazing equipment, and glaziers themselves, have been introduced. Production of tiles with a great range of colors, textures and designs have been organized. These products are beautiful and durable. However, experiments have not ceased. At the Minsk construction material combine, a new technological production line is being perfected. Tile glazing is done by a glazing method through a "bell" device. This method permits to use higher density suspensions. The coating quality obtained is excellent and operations of the entire conveyor are stable. Multi-colored decorative tiles across the broadest spectrum--white and colored single-tone, with two- or three-colored designs both above and below the glaze--can be manufactured on it.

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### OPPOSITION TO USE OF CEMENTLESS CONCRETE QUESTIONED

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[Article by A. Volkov, IZVESTIYA special correspondent, Chelyabinsk-Moscow: "Concrete Without Cement"]

[Text] Red tape in the practical introduction of this progressive development has dragged on for 13 years. Who is at fault in this?

The fact that the Chelyabinsk Building Materials and Products Combine was the first in the country to master the industrial manufacture of structural products made of a new building material -- cementless concrete -- was reported by IZVESTIYA in issues No 129/131 for 1983. The publication evoked the interest of specialists from various sectors of the national economy. "We earnestly request that you report the formula and technology for manufacturing these types of concrete. We are interested in the possibilities of their application in boring geological survey wells," writes Deputy Director of the Transbaykal Complex Scientific-Research Institute L. Volkov. "As a point of information and exchange of experience, I ask you to report the approximate expenditure of materials per one cubic meter. What types of slag are used in production, and what are the requirements for them? What concrete mixing and batching equipment is used at the combine for preparing the concrete mixture?", asks the Chief Engineer of the "Khimprom" production association in Kharkov oblast M. Gar'kavyv.

The multitude of letters received by the editorial office and the combine demonstrated once again the scarcity of information on slag-alkali cement. However, this "innovation" was not born yesterday. This year it has been 25 years since the hydraulic binding properties of alkali metal compounds have been discovered, and the technology of manufacturing cementless concretes based on them was proposed 13 years ago. Why is it that this progressive development is being so slowly introduced into practical application?

Let us briefly review the history of this question. A quarter century ago, a graduate of the Kiev Engineering-Construction Institute, V. Glukhovskiy, took on the task of guessing the secret of granite's strength, which was not subject to either water, fire, or time. He noted the fact that granite contains in its base certain alkaline elements which are not easily soluble in water.

At the same time, it is a very strong monolith! How is this possible? Could the processes occurring during the mineral formation be simulated? He succeeded in simulating them and proved that concrete which greatly surpasses Portland cement in strength may be obtained on the basis of alkaline binding agents. But even though the results of the young scientist's experiments amazed many people, the new concrete was not given its right to life.

No, no one denied the advantages of the new material -- they were too apparent. However, the position of the departments responsible for technical progress in the building industry, and primarily the head institute of VNIIZhelezo-beton [All-Union Scientific-Research Institute on Reinforced Concrete] was the following: slag-alkali concrete is our future, while Portland cement is the present. So you may continue working, conducting tests...

V. Glukhovskiy defended his candidate's and later his doctoral dissertation. He was placed in charge of the laboratory and continued tests on improving the new concrete. In Odessa Oblast near Izmail, troughs were laid made of Portland cement concrete and of the new slag-alkali binding agent based concrete during the installation of an irrigation system. Nine years later, samples were taken for testing. It turned out that the troughs made of Portland cement had already deteriorated, while those made of the new concrete not only were undamaged, but had taken on greater strength than they possessed initially. The tests conducted confirmed the better properties of the slag-alkali concretes: frost- and corrosion resistance, and mainly their high strength.

And now what? Dissertations are being defended based on these results, but the matter is not moving ahead. Chelyabinsk residents have formulated the results of the work in the form of practical recommendations and directed them to the USSR Minpromstroymaterial [Ministry of the Construction Materials Industry] and the USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises]. However, there has been no response. At the same time, the desire to change over to the production of cementless concretes is being expressed by tens of plants in the North, Siberia, and the Far East -- the places where the largest construction sites are being developed and where the cement shortage is most acutely felt. Moreover, the progressive development of V. Glukhovskiy is already being used in the technology of the construction industry abroad -- in Switzerland and Finland. Meanwhile, we are still experimenting...

The wait-and-see position of the USSR Gosstroy and the All-Union Institute on Reinforced Concrete (VNIIZhB) is puzzling. A year ago they were charged with determining a product nomenclature in the shortest possible time and with developing GOST standards for new binding agent materials. Time has passed, but not one of these documents has been created at the institute. Why?

"We have a coordinated plan," says the Head of the Concrete Corrosion Laboratory Sector of VNIIZhB, F. Ivanov. "In accordance with it we have been asked to evaluate the new concrete. You see, we have a mistrust, if you will, of innovation. Plants change and each time a new raw material is used. But we must have representative, time-tested samples.

The increased attention to the status of institute specialists comes down to the fact that repeatedly honed technology never leaves the infancy of endless experiments. Although what experiment is it if the Chelyabinsk Combine will already this year manufacture over 20,000 cubic meters of economic and very strong structures -- foundation blocks, borders, troughs, and road surfacing slabs -- according to the new technology, replacing the temporary scheme?

"In the course of introducing the new concrete, a type of psychological barrier has not yet been overcome," says Combine Director V. Tarasov. "Many consumers are put off by the fact that the passport documentation for, let us say, a foundation block, states: 'Cement -- zero'. New technology requires legal substantiation, and as yet there is none."

Experimental production has shown that mixing of concretes with varying properties at a single enterprises is inadmissible. Therefore, the question of production specialization is raised most acutely. A directive has been issued throughout the USSR Mintyazhstroy which provides for the production of structures made of slag-alkali concrete up to 200,000 cubic meters before 1985.

Meanwhile, a narrow nomenclature of products is being produced from cementless concrete in Chelyabinsk -- foundation blocks and borders. In the Urals they would like to go further -- to manufacture suspended structures, beams and trusses. However, the properties of the new concrete in structures of this type have not yet been tested. The local UralNIISTromproyekt [Ural Scientific-Research Institute on Construction Materials] has at its disposal a good base for testing. At the "Chelyabmetallurgstroy" association, I became acquainted with a contract project which had been prepared back in May, but which had not yet been signed.

Meanwhile, the specialists of UralNIISTromproyekt have long and purposefully been engaged in developing technology for the manufacture of binding materials using the by-products of local metallurgical and chemical industries as their raw material.

The high effectiveness of the new concrete does not need special proof. About nine carloads of cement are required daily for the continuous operation of the combine. Cementless concrete will make it possible in the future to economize exactly this amount every day. Preliminary computations show that already this year the economic effect will exceed 125,000 rubles.

Much is dependent on the absence of normative documents for product output. There are only temporary technical conditions which were at one time ratified for the manufacture of structural elements from grades "200" and "300" at enterprises in the Ukraine. The USSR Gosstroy extended their effectiveness to the territory of the Urals, "forgetting" about the fact that in the Ukraine the success of production was conditioned by the effective application of local raw material resources -- granulated slag and alkali activators.

During preliminary solution of the question of where the granulated slag would be obtained for plant operation, the Glavyuzhuralstroy management considered that there are two slag grinding installations within its system with an annual productivity of 25,000 tons. Even working around the clock, these slag mills could not provide the Glavyuzhuralstroy enterprises with enough raw materials. The question has arisen regarding the construction of a new installation in the city with a capacity of up to a million tons of granulated slag per year.

In the meanwhile, slag is transported for hundreds of kilometers. The transport expenditures are high and, as a result, the production cost of the new concrete is much higher than anticipated. One of the mills is located at the combine. Before the new technology was introduced, its production was enough for everyone. Now, however, the situation has changed. Each day the combine produces only a third of the concrete planned per shift. On some days the granulated slag is not brought in at all. Here the problem is not only a shortage of cement trucks. As early as June, a Glavyuzhuralstroy directive provided for doubling the production of granulated slag and for ensuring its availability in the amount of 5,000 tons in the second six-month period. Already today 40 tons of granulated slag must be delivered to the combine each day, but the actual amount is two times less.

The introduction of the promising development deserves greater attention on the part of the local party and soviet organs. What a remarkable situation: the combine is experiencing chronic shortages of granulated slag. It is being brought in from Magnitogorsk, and literally several hundred meters away there are the huge slag dump sites of the Chelyabinsk Metallurgical Plant. Ten years ago the Chelyabinsk Gipromet [State Union Institute on Metallurgical Plant Project Design] performed a technical-economic substantiation for processing furnace and steel smelting slags at Ural plants, determining the direction of development of slag processing for each specific enterprise. Nothing has been done in regard to this outline. The situation at other plants is also no better. Slag dump sites are increasing each year, with less than half of them being processed.

As we know, the resolution of the CPSU Central Committee and the USSR Soviet of Ministers, "On Measures for Accelerating Scientific-Technical Progress in the National Economy" outlined the course for the large-scale introduction of scientific achievements into production. We believe that the introduction of cementless concretes is one such problem. Due to the fact that the new technology is being placed into production at a tortoise-like pace, the state has not received millions of rubles in income. This, mildly speaking, is not good economic management.

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